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ABSTRACT

This publication reports the results of a review of scientific research on office job hazards, survey responses from more than 1,200 office workers in Cleveland and Boston, and in-depth interviews with more than 100 office workers. The report covers the following areas of health hazards for office workers: (1) job stress--physical and psychological effects; (2) health problems associated with video-display terminals (VDTs), the major components of office automation; (3) office air quality and ventilation; (4) office environment: noise, improper lighting, and workplace and machine design; and (5) safety hazards (accidents, injuries, and fire hazards). The sources and health effects of each hazard are documented, and recommendations are made for research and action needed to correct the problem. Because the dangers in the office have only recently been recognized, protective standards have not yet been developed. The report urges a variety of steps toward a safe and healthful workplace for office workers--increased public attention to office hazards, manufacturer and employer action to reduce hazards, employee action to identify and address common problems, and government action to set and enforce standards for safe office working conditions. (KC)

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WARNING:

Health Hazards for Office Workers

An Overview of Problems and Solutions in Occupational Health in the Office

Report by:

Working Women Education Fund
1224 Huron Road
Cleveland, Ohio 44115

April 1981

CE028 799

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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WARNING: HEALTH HAZARDS FOR OFFICE WORKERS

An Overview of Problems and Solutions in

Occupational Health in the Office

Office work, though low paid, has at least been considered safe and clean. However, recent research proves that health and safety hazards in the office are serious and widespread.

From carcinogens in copying machines, to ventilation systems that circulate poisoned air, to an epidemic of stress-related diseases, office workers face profound dangers affecting our lives. We must find solutions, for our health, our jobs, and the quality of life are at stake.

Karen Nussbaum
President
WORKING WOMEN
April 22, 1981

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WORKING WOMEN is a national association of office workers with affiliates in 13 major cities and members in every state, working to win rights and respect.

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I. INTRODUCTION

Office work, once considered safe, clean work, is now known to involve serious health hazards.

The past two years have seen an explosion of concern among health experts--and among office workers themselves.

Concern over industrial health and safety goes back many years. Government standards and union contracts have provided safeguards against some of these hazards.

The full extent of the dangers of office work is not yet known. Yet scientific studies have now firmly established that health and safety hazards for office workers are serious and widespread. Constant sitting in poorly designed chairs, "stuffy" office air polluted by irritating fumes, a stressful work pace and tight deadlines--these were once accepted as "just part of the job." Now these working conditions are recognized as potential hazards to office workers' health.

As the economy has changed, clerical workers have replaced manufacturing workers as the single largest sector of the workforce. More than half of all new jobs will be white collar in the 1980's. 1/ Some business spokesmen predict that by the year 2029, 80 to 90% of the entire workforce will be in jobs involving information processing. 2/ This shift has heightened interest in office working conditions.

Twenty million women hold office jobs. Eighty percent of clericals are women. Keypunch operator, typist, file clerk, secretary--their work is characterized by low pay, lack of promotion opportunity, little control over the pace or organization of work, and little recognition of accomplishment. Only 11% of all clerical workers in the U.S. are represented by unions. In private industry, 6% or fewer are unionized. Consequently, office workers suffer a lack of legal information, job security, and influence over working conditions. The most common response to unpleasant working conditions is to quit--and very likely face similar conditions in the next job.

Research indicates that the hazards of office work have a particular impact on women, who are most likely to occupy the most highly regimented jobs, experience the greatest stress, and have the heaviest home responsibilities on top of their job duties.

We now know that it's not only the highly paid executive who is likely to get a heart attack from the heavy responsibilities of his job. It's also his secretary! In fact, an unsupportive boss may be hazardous to your health. 3/

Office job hazards appear to be worsening. The rapid rise in office automation is maximizing the factors that can lead to stress-related disease--such as machines that cause muscle strain, long hours of sitting, repetitive tasks, low control over work pace, and shift work. Today, 22% of all office machine operators work evening or night shifts, compared to 10% of all white collar workers. 4/

The drive for energy conservation has led to "sealing" of older buildings and construction of "tight" new offices. Poorly maintained humidification systems can allow infectious bacteria to breed. Inadequate ventilation can recycle bacteria, dust, cigarette smoke, and harmful airborne chemicals throughout the building. In this sealed environment, the increased use of synthetic furnishings and supplies and machines that emit toxic fumes can turn offices into "virtual gas chambers." 5/

In addition, many clericals work in proximity to industrial plants where they may be exposed to industrial fumes, high noise levels, and other problems. An office manager for a Pennsylvania steel company describes her working conditions:

> "My office is approximately 12' x 24', situated inside a metal fabricating factory where the punch presses, lathes, grinders, milling machines and welding machinery are being run daily. We not only have noise, but inadequate ventilation -- no windows at all, just the office door, and one little space heater for winter months, 6 large desks, 4 filing cabinets and 5 people -- 2 of whom smoke incessantly."

Project: Health and Safety is carried out by the Working Women Education Fund with partial funding from the U.S. Department of Labor Occupational Safety and Health Administration. This report results from a review of scientific research on office job hazards, survey responses from over 1200 office workers in Cleveland and Boston, and in-depth interviews with over 100 office workers. The project also holds workshops for office workers on identifying and reducing job hazards and brings public attention to office health hazards.

The report covers the following areas of health hazards for office workers:

- job stress, its physical and psychological effects
- health problems associated with video-display terminals (VDTs), the major component of office automation
- office air quality and ventilation
- office environment: noise, improper lighting, and workplace and machine design
- safety hazards: accidents, injuries and fire hazards.

The sources and health effects of each hazard are documented, and recommendations are made for research and action needed to correct the problem.

Because the dangers in the office have only recently been recognized, adequate protective standards have not yet been developed. This report urges a variety of steps toward a safe and healthful workplace for office workers--increased public attention to office hazards, manufacturer and employer action to reduce hazards, employee action to identify and address common problems, and government action to set and enforce standards for safe office working conditions.

II. JOB STRESS IN THE OFFICE

Loretta works as a switchboard operator at a major insurance company in Cleveland. She developed coronary heart disease at the age of 27.

> "Fresh out of three years of college, with a background in accounting, the company assured me that the switchboard job was temporary and promised to cross-train me for an accounting job in the near future...Right after I began work, they asked me to fill in for awhile in the mail room in addition to my switchboard duties. I soon became indispensable to them, doing both jobs at once...Earlier this year, I took a two-week sick leave to recover from mono, but they called me back after one week, though I could barely walk up the stairs...I went to talk to personnel about a transfer or a training program. 'You don't have the experience to do other jobs,' I was told, 'and what is more, your attendance has been unacceptable.' He ignored my explanation that doing two jobs was making it difficult to recover from mono...Before I had this job, my health was excellent. But in September, my doctor diagnosed me as having a heart condition called atrial arrhythmia, which means that my heart beats irregularly, I get tired very easily and often have hot flashes and nausea. My doctor and I are both convinced that the conditions I am forced to work under have brought on this illness.
>
> So here I am, two years after having so confidently begun my career, still working at the switchboard, I am stuck in a dead-end job, my medical benefits are exhausted, I make under $10,000 a year, and I have permanently lost my good health."

A Stress Epidemic

Recent research is beginning to uncover a virtual epidemic of stress symptoms and stress-related disease among office workers. Millions of workers are affected. And because the symptoms do not end when the worker walks out of the office at the end of a day's work, the families of millions may also be affected by the problems caused by office job stress.

Furthermore, the trend toward automation in office work is exacerbating the very job factors found to be most stressful, while threatening to eliminate those aspects of the job which promote job satisfaction and counteract stress.

Within the last year, the public and the scientific community have been shocked into recognizing the high levels of job stress endured by women office workers.

* Results from the Framington Heart Study (February, 1980) showed that women clerical and secretarial workers developed coronary heart disease (CHD) --clearly identified as a stress-related malady--at nearly twice the rate of other women workers. 1/

* The National Institute of Occupational Safety and Health (NIOSH), studying the insurance office of Blue Shield in San Francisco, found higher levels of

job stress among operators of video display terminals (VDTs) in strictly clerical jobs than any other occupational group ever studied by NIOSH -- including air traffic controllers. 2/

Surely stress has been part of office work for a very long time. But, today stress and its effects on health command increasing attention. Why? For one thing, the major causes of death in the U.S. have changed over the last century from infectious diseases to chronic killers such as cancer and CHD. Through research, scientists can demonstrate the role of a lifetime's exposure to stress at work in these diseases and many more. This formerly "unseen" or "hidden" hazard is coming into focus.

The new findings about stress among office workers came as a surprise; they are still met with resistant disbelief by many managers. One fact which helps to account for some of the surprise: before the 1970's, virtually all stress research was done with white men only. Women workers were not included in most studies. To this day, there is almost no research on job stress experienced by minority workers. Among white-collar workers, "executive stress" or "managerial stress" received a great deal of attention, while clerical and secretarial workers were ignored until recently. 3/

The combined roles of paid work and work at home for women, and the prevalence of hypertension among the black population are examples of "complicating factors" which led researchers to exclude these workers from previous studies. Now, these same factors lead many researchers to predict that they will find more harmful health effects from stress than were measured among managers or young, white male workers. In particular, race discrimination may act as a constant, underlying source of stress, adding a daily dose of hostility or isolation, or both, to each workday. 4/

Common Myths About Stress

There are many commonly held ideas about stress. The more we learn about occupational health, the more these myths break down, but they are still widely believed:

Myth #1: "People with great responsibilities who make lots of important decisions have the most stress."

Myth #2: "A person brings stress from home into work with them. If they're under stress, it's because of family or personal problems."

Myth #3: "Certain people are just more susceptible to stress. It's not the job: stress is a very individual sort of thing."

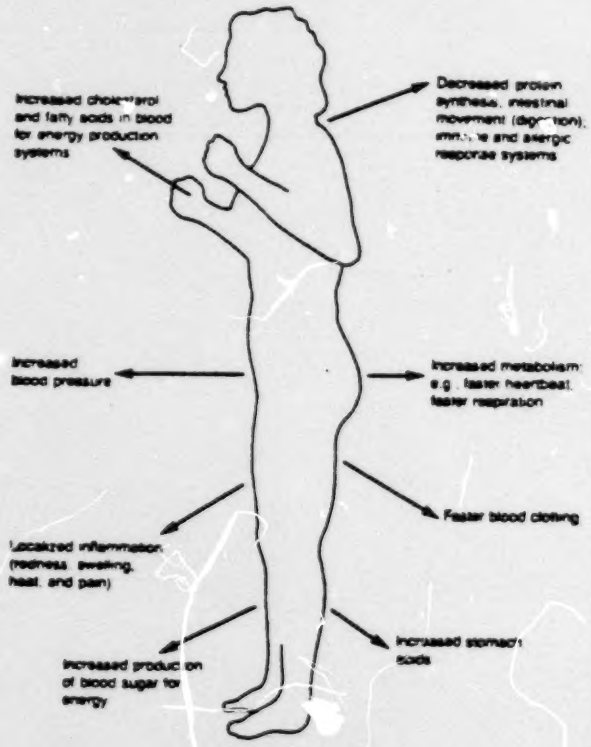
In the following pages, research on stress which disproves these myths will be reviewed, sources of stress in office work will be examined and strategies for reducing stress in the office will be discussed.

Stress Defined

The "stress response" is your body's way of preparing to meet a physical, mental or emotional demand or challenge. Virtually every major system of the body is involved. A series of internal reactions occurs which includes:

> "...an increase in heartbeat and breathing rates, increased secretion of stomach acid, and release of hormones that affect metabolism. Emergency release of adrenaline occurs, as well as a rise in cholesterol and energy-rich sugar levels in the blood. More energy goes to your muscles, and the stomach becomes inactive. These are acute reactions to a stressor (a source of stress)." 5/

Figure 1:
Aspects of the Stress Response


Increased cholesterol and fatty acids in blood for energy production systems
Decreased protein synthesis, intestinal movement (digestion), immune and allergic response systems
Increased blood pressure
Increased metabolism: e.g. faster heartbeat, faster respiration
Faster blood clotting
Localized inflammation (redness, swelling, heat, and pain)
Increased production of blood sugar for energy
Increased stomach acids

Reprinted courtesy of Dr. Stellman.
From: Women's Work, Women's Health, Ch. 2: "Work, Stress and Health."

The body gears up to meet the stressful situation. This is often called the "fight-or-flight" response since the same physiological reaction occurs whether a person is excited or afraid. 6/ Some "stress" is good -- excitement, enjoyment, a challenging and interesting event will arouse the "generalized stress response." Without such stimulation, life would be dull.

It is chronic -- continuous or prolonged -- stress which poses a danger to health and well-being. Normally, the body returns to a state of equilibrium after meeting a challenge. But if the causes of stress remain constant, the body is kept off balance. The protective responses described above can become destructive, and health problems may result over time. "What the body can't cope with is day-in, day-out stress that has no reward or end in sight." 7/

In this report, "job stress" is used to refer to chronic, excessive stress or strain on the job, rather than the general stress response of the body.

Health Effects of Job Stress

"Extraordinary or continually unwanted stress costs us energy, deprives us of tranquility, facilitates the occurrence of some diseases and even outrightly causes others," writes Dr. Jeanne Stellman of the Women's Occupational Health Resource Center.

Exposure to stressful conditions at work over a period of weeks or months can lead to stress-related health symptoms and problems. If stressful conditions continue for many months or years, serious chronic illnesses can develop -- inclu-

including coronary heart disease, ulcers, spastic colon and hypertension. Migraine headaches, exacerbation of skin problems such as excema, asthma, cancer, joint inflammation and arteriosclerosis have also been linked to chronic stress. Longterm psychological reactions may occur -- depression, constant tiredness or malaise, or even a "nervous breakdown." 8/

It's important to realize that muscular strain, visual strain, nervous system strain, mental fatigue and psychological strain cannot be neatly separated from one another. These problems build on each other and can lead to a state of exhaustion, which increases a person's susceptibility to illness.

What a person does about anger, frustration or anxiety on the job -- and what a person can afford to do about health problems from job stress -- will also influence what happens to his or her health.

Stress and Disease

Chronic stress is known both as a "disease producer" and a "disease enhancer", whose effects are both systemic and specific. In relation to illness, stress can play a direct role -- as with ulcers or coronary heart disease -- an additive role -- aggravating diabetes, asthma, cancer or skin rashes -- or a synergistic role -- creating a combined health risk greater than two or more problems simply added together, as in the case of someone who smokes and is under stress. In studies of highly stressful jobs, excess rates of every psychosomatic disease that could be studied have been found. 9/ In other words, a stressful occupation increases the risks of many diseases which are affected by one's state of mind or feelings, which in turn have physical consequences.

In a study of 2,000 men in 27 occupations, researchers found that workers reporting gastro-intestinal problems, diarrhea, colitis and gall bladder problems also experienced higher levels of anxiety than co-workers. Anxiety was identified as the psychological strain most striking in relation to physical illness.10/

Job stress has different effects on different individuals. Some common symptoms include: nervousness, loss of appetite, periods of easy irritability, anxiety, chest pains, trouble sleeping (insomnia) and raised blood pressure. Headaches (especially migraine headaches), backaches, toothaches (from grinding teeth), spasmodic pains in the neck or shoulders, skin rashes, catching colds, viruses or other illnesses easily are also common symptoms of stress. Job stress can play a role in menstrual irregularities and in recurrent vaginal or bladder infections. Both men and women often experience sexual difficulties as a result of being under a great deal of stress.

Psychological Effects of Stress

Common effects on mood and feelings include: anxiety, depression, irritability, confusion, fatigue, boredom, guilt, anger or resentment, low self-esteem, a sense of hopelessness or feelings of worthlessness.

Researchers note that psychological stress reactions among office workers "tend to be mood disturbances and not severe psychoses". There is no evidence that clerical workers are at any greater risk of "psychiatric injury" than people in other jobs.11/ But, being under stress can hurt relations with friends, co-workers and family members, making it harder to get help from others when it's most needed.

Effects on Home Life

Stress does not just come from the job nor does stress "just come from the home and get carried into work" -- as we often hear. Because chronic stress at work is likely to affect a person's self-image and relations with others, the effects of job stress last much longer than the hours spent in the office. Stress at work affects the family and friends of the employee under stress as well -- causing concern and worry for the person's health and state of mind, increasing the likelihood of depression, arguments or conflict at home, and adding to economic pressures with medical expenses.

The view that the main direction of stress is from work into the home is gaining acceptance. "Job stress may be a very personal experience, but it is by no means a private one," Dr. Elliott Liebow of the Center for Work and Mental Health of the National Institute of Mental Health explains. "It's crucial to realize that the stress experienced by the worker and his or her reaction to them -- depression, anxiety, anger, boredom, shame -- or respiratory, blood pressure or stomach problems -- that these things do not stay in the workplace. The worker takes them home, where they shape his or her relationship with his or her family and friends...These stresses are diffused throughout the community. After a while the worker, or members of his or her family become a statistic having to do with alcohol or drug abuse, physical illness, mental illness, family break-up, violence or something else. And then the worker may even become one of those 'troubled workers' who brings his (sic) problems with him into the workplace." 12/

A study of fatigue, nervousness and job dissatisfaction among women key-punchers concluded that "the subjective feelings associated with fatigue are delayed such that their major impact occurs after the work period is over."13/ Swedish research finds that people in "passive" jobs which allow them little control at work tend to be more withdrawn socially and less involved in civic activity than people in "active" jobs which allow more control over the pace and organization of work.14/

Harmful Side Effects of Stress

Increased cigarette smoking, increased use of alcohol and increased use of prescribed or unprescribed drugs are common responses to stress which can in turn become harmful "health effects" of stress. Instead of providing genuine relief, reliance on such means of "escape" from stress may only make matters worse.

Over the last decade, studies have shown an increase in the number of women workers who smoke cigarettes, while smoking among men declined in the 1970's. 15/ Scientists estimate that at any given time, at least 4 million people are taking tranquilizers prescribed by their doctors. 16/ While taking a prescribed "calming" drug such as Valium or Librium may help a person get through a hard working day, such drugs can have terrible effects on health. Alcoholism among women is receiving increased public attention.

Excessive drinking and drug use are often hard for women to admit or discuss, since they carry a certain social stigma. They are ways of trying to get away from the anxieties of frustations caused by stressful working conditions which will only make it harder to identify and eliminate the sources of stress.

While these are clearly ineffective or destructive responses to stress, women workers cannot always choose the best way to deal with stress symptoms. For working women, a major problem in dealing with health symptoms is low pay and lack of adequate benefits. Many of the respondents to the Office Workers Health and Safety Survey commented that they could not afford to take time out

to see a doctor or to get away from their job long enough to relax or catch up on rest. (See Section VI). Many women also commented that they often go to work sick because of restrictive company policies (lack of enough paid sick days, vacation or personal days).

Stress in the Office

***A study by the National Institute of Occupational Safety and Health (NIOSH) conducted in 1975 found that secretaries had the second highest incidence of stress-related diseases among 22,000 workers in 130 occupations. The research team identified 1) rapid work-pacing, especially machine-pacing, 2) long working hours and 3) repetitive or monotonous work as the factors leading to high levels of stress among very different jobs. (Secretaries ranked second after unskilled laborers.) 17/

***Results of the Framingham Heart Study released in February 1980 show that women clerical workers developed coronary heart disease (CHD) -- clearly identified as a stress-related disease -- at almost twice the rate of other women workers including housewives (previously thought to be at greater risk than working women). Furthermore the 8-year study found that women clerical workers with children and blue-collar husbands developed CHD at nearly twice the rate of all men workers. 18/ (See Figure 2.)

The researchers found that secretaries, typists and other clericals who developed CHD were more likely: (1) to have an unsupportive boss; (2) to suppress feelings of anger; and (3) to experience few job changes over a ten-year period. Drs. Haynes and Feinleib write: "These findings are consistent with observations that women clerical workers may experience several forms of occupational stress, including lack of autonomy and control over the work environment, underutilization of skills and a lack of recognition of accomplishments."

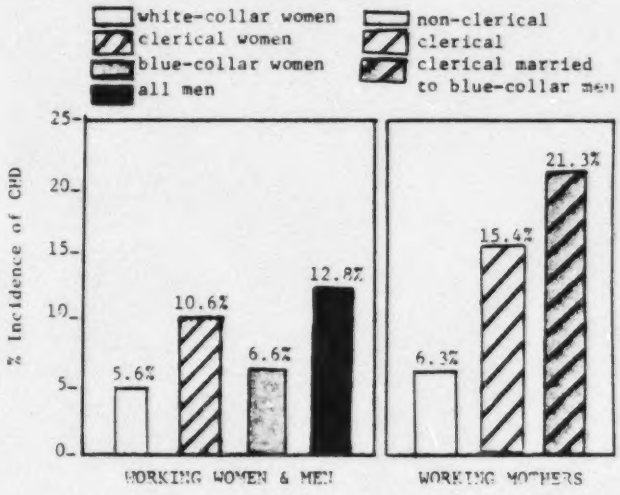


FIGURE 2: 8-Year Incidence of CHD For All Men and For Working Women Age 45 to 64 By Occupation, Marital Status and By Children. Adapted from Haynes & Feinleib, "Women, Work and Coronary Heart Disease: Prospective Findings from the Framingham Heart Study," February 1980.

White-collar includes professional & managerial
Blue-collar includes manual & service workers

More than one in five women clericals with children and married to blue-collar men developed CHD in the course of the study (21.3%). None of the participants had heart disease at the outset. The extraordinarily high rate among women clericals with blue-collar families led the researchers to conclude that "economic stress" played an important role in the health problems which the women suffered.

***The American Academy of Family Physicians found, in a study of six occupations, that two-thirds of the secretaries described their work as "usually" or "always" stressful. 19/

More employees are filing -- and winning -- Worker's Compensation claims, including women office workers 21/:

*An older legal secretary received permanent disability payments for a "psychotic break" which occurred after she was teased incessantly by a young attorney while carrying a heavy workload at a California law firm. One day her arm went numb, she became dizzy and couldn't speak clearly.

*A secretary at Burroughs Corporation won a $7,000 disability claim in Detroit after she became hysterical when her boss would not stop asking prying, personal questions and criticizing her for going to the bathroom too often.

*A bookkeeper for an insurance agency won a claim in Arizona for a compensable industrial accident when she ended up in a psychiatric hospital after taking a slight overdose of sleeping pills. She had been working long hours of overtime for her employer, an expanding insurance agency.

In the Office Worker's Health & Safety Survey, 72.5% of respondents reported "somewhat stressful" or "very stressful" working conditions. The sources of stress reported are shown in rank order in Table 1.

TABLE 1: Office Worker Health & Safety Survey[1]

RANK ORDER	SOURCES OF STRESS ON THE JOB	ADJUSTED FREQUENCY RESPONSE[2]
#1	Lack of promotions or raises	51.7%
#2	Low pay	49%
#3	Monotonous, repetitive work	40%
#4	No input into decision-making	35.1%
#5	Heavy workload/overtime	31.3%
#6	Supervision problems	30.6%
#7	Unclear job descriptions	30.2%
#8	Unsupportive boss	28.1%
#9	Inability or reluctance to express frustration or anger	22.8%
#10	Production quotas	22.4%
#11	Difficulty juggling home/family responsibilities	12.8%
#12	Inadequate breaks	12.6%
#13	Sexual harassment	5.6%

Notes: (1) The survey was distributed in Cleveland and Boston in the fall of 1980. Full results are presented in section 4 of this report. (2) Adjusted frequencies are based on 915 respondents answering the questions on stress (95.3% of the total 960 survey respondents).

In office work, a series of major workplace stressors (sources of stress) converge in the nation's largest single occupation.

Clerical work now represents nearly one in five members of the U.S. workforce, and accounts for more than one in three women who work.

Most often, women office workers lack organized means to improve pay, benefits or general working conditions.

Sources of Stress on the Job

The harmful effects of job stress usually result from the cumulative, combined effects of a set of job pressures and problems -- rather than a single cause of stress. A number of interrelated factors must be considered: (1) the objective conditions of the job; (2) the level of job satisfaction or dissatisfaction, potential for advancement opportunities and the ability to exercise some control over the pace and organization of work; (3) how indi-

viduals react to job characteristics (as "challenging" or "stressful"); (4) the varying effects of stress on different individuals and varying ways of dealing with stress; and (5) whether a person under stress has "social support" on and off the job.

Job stress should be examined with a "systemic" approach. Stressors in clerical work include: environmental stressors; ergonomic problems -- problems related to poor equipment, workstation and job design; socio-economic sources of stress; employer-employee relations; and the pressures of service work which involves contact with clients and the public. Whether a person is rewarded for their efforts or not, and what they can do to change conditions and eliminate stress are important factors which can make a situation better or worse, by either "moderating" or intensifying stress.

TABLE 2 illustrates the multitude of stressors common to office work. Information is drawn from a wide range of scientific sources. 22/

TABLE 2.

SOURCES OF WORK-RELATED STRESS AMONG OFFICE AND CLERICAL WORKERS

ENVIRONMENTAL	JOB DESIGN
noise, lighting	rapid work pace
skin irritants	lack of control over time & work
temperature and humidity problems	work at keyboards & VDTs
large-space "open" office	constant sitting
poor workstation and furniture design	repetitive, stereotyped tasks
inadequate ventilation	lack of adequate rest breaks
windows that won't open	heavy workload/overtime
overcrowding	underutilization of skills
safety and fire hazards	office automation
EMPLOYER/EMPLOYEE RELATIONSHIP	**SOCIO-ECONOMIC FACTORS**
lack of respect	low pay
non-supportive bosses	dead-end jobs
too many bosses	high incidence of job dissatisfaction
pressure for higher productivity	dual role of women workers
responsibility without authority to make decisions	lack of childcare
lack of recognition for promotions	the experience of sex, race and/or age discrimination
inability of employees to express anger	increased workload due to staff cutbacks
ineffective or non-existent grievance procedures	job insecurity

Use of VDTs, indoor air pollution and other problems in the office environment will be discussed in later sections of this report. In this section, the focus is on job design characteristics and institutional stressors.

Key Sources of Job Stress

Previous research identifies major causes of stress which affect employees in vastly different jobs:

Heavy Workload. Too much work to do in too little time comes up again and again as one of the top sources of stress. In studies of air traffic controllers, the men in the areas of the most dense traffic were the ones who developed hypertension at a very early age, while controllers in areas of normal traffice flow showed an average incidence of the health problem.

Insufficient staffing and unreasonably high demands for "output" are frequent problems for office workers. Conflicting demands from "too many bosses" often compounds the stressfulness of a heavy workload.

> D.M. describes two successive jobs at one of the country's most prestigious universities. In her first job, she typed for several professors, with no one supervisor to intercede when deadlines conflicted. As a result, she had extreme pressure to complete work by unrealistic deadlines. Her boss was very unsupportive; he was unwilling to back her up for raises or promotions. When she was out sick, he called her at home with work-related demands. Because D.M.'s stomach problems became so severe, her doctor advised her to transfer out of the first job to avoid developing an ulcer.
>
> In her current job (as in the first) the pay is very low, while the workload is very heavy with frequent overtime expected. She often works continuously with no breaks or lunch hour. She experiences constant interruptions from professors and impatient students.
>
> D.M. suffers from insomnia, her sleep often interrupted with nightmares about not being able to meet deadlines at work. She has shoulder and neck pains from typing, photocopying and collating all day. To try to deal with the stress from the job, D.M. takes tranquilizers prescribed by her doctor, finds she overeats and has drinks almost daily after work.

Balance is very important in workload problems, as researchers point out that too little work can also cause stress. The "quality" of the workload should be considered, too. An especially bad combination is having too much work (a "quantitative overload") which holds too little interest or offers too little challenge (a "qualitative underload"). Such a combination becomes even more common with the advent of automation in lower-level office jobs. 23/

Long Working Hours. Previous studies of male workers provide evidence of a strong relationship between long working hours and stress-related disease.24/ One study found that men who worked 48 hours a week in light industry had twice the rate of death from coronary heart disease as those who did the same work for no more than 40 hours a week.

Secretaries and clericals in certain jobs cite frequent unexpected overtime, usually mandatory, to meet deadlines or handle seasonable heavy volumes of work.

> Patricia is a word processing specialist who worked for Boston Safe Deposit & Trust Co. last year. The job involved researching notes for a weekly publication. Besides skipping lunch every Thursday to meet the weekly deadline, Patricia often had to work through lunch and do overtime in the evening because the people whe worked with ignored deadline dates. In a typical week, she put in 60 hours for her $13,500 yearly salary. There was little respect for her work in the office and she lost confidence in herself. She experienced daily back, neck and eye

strain. Three days out of five, she was totally physically exhausted by the time she got home. She couldn't sleep some nights from worrying about her job.

Patricia is much happier and more confident in her new job. The bank presently has 4 people doing the job she did alone. Recently her former supervisor offered her $400.00 a week to return to Boston Safe Deposit & Trust. Her response: "NO WAY."

Exceptionally long working hours for women result from their "dual role" as homemakers and wage earners. The average working woman puts in 70 to 80 hours a week when work in the home is added to work in the paid labor force. Married men average 50 hours a week. 25/ "The modern working woman is on permanent, unpaid overtime."

Some researchers believe that overtime and heavy workload are only significant when correlated with job satisfaction. In other words, when a person is rewarded for extra time and effort, his or her health is not as likely to be adversely affected as that of someone in a dead-end job, according to the results of recent studies. 26/

Rapid Pacing and Machine-Pacing of Work are very powerful factors in stress-related symptoms. NIOSH researchers believe that rapid work pace is one of the major reasons for their finding of extremely high levels of job stress among secretarial and clerical workers. 27/

Office work has traditionally involved meeting many deadlines, making fast, frequent decisions, and carrying out quick transactions. Today, office work is being "speeded-up" as factory-based methods of time-motion study are being applied inappropriately to information-processing work.

An 8-year employee of the data-entry department of a large Cleveland utility, describes the increased pressures and health problems where she works:

"Everything seemed just fine at work until last summer, when a company-hired management consulting firm came into our department, supposedly to study how management could work better. But instead of improving management's operation, the consultant began to carefully measure and time our production speed! We used to have to process a maximum of 4000 checks a day. Now 4000 has become the minimum -- that's one check every 6 seconds -- and the average they require is between 5 and 6,000 -- about 4 seconds per check.

Now, they are treating us just like machines, expecting that everyone can do exactly the same amount every day, no matter how hard or easy checks are to process. It's hard to keep your temper from flaring when you're so tense about meeting production quotas. Someone is going to have a nervous breakdown in there someday. I just know it...

Almost all of us are having eyestrain and headaches at the end of the day, and half the girls are having stomach problems, as well as back pain, neck pain, aching shoulders, arms and wrists. Two of the women have been told by their doctors that they have pre-ulcerous conditions. I know a lot of people haven't been sleeping well, which means we get sick a lot more easily and have an even harder time keeping up with the pace of work."

Recent years have seen an increase in the use of automatic call distributors, prompters, production quotas and computerized monitoring of clerical work. Management introduces these devices in efforts to "increase productivity" by taking control over the speed of work away from the office workers themselves. But research is beginning to show that performace often declines along with job satisfaction when control over work pace is transferred from people to machines or computers. In studies of machine-paced vs. self-paced work, error rates increase from 40% to 400%. 28/

Monotonous/Repetitive Work. Studies find the highest rates of total fatigue or exhaustion associated with the highest reports of monotony on the job. Monotonous work which requires close attention to detail but holds little interest for the employee is particularly stressful. Doing the same stereotyped motion all day causes muscular fatigue as well as job dissatisfaction. Performing the same set of routines without the chance to learn new skills can lead to boredom , frustration and decline in self-esteem. 29/

> "I've been doing this job for 10 years, and I've been tired for 10 years," says a 30-year-old data entry operator. "It's the monotony that does it. I'd like to know what it feels like not to be tired."
>
> A woman who worked as a clerk-typist in a large San Francisco law firm recalls: "In that law office job, 'cause I hated it so much and it was so boring, I just felt like I was the living dead. I had no attitude. It was like being in a coma for two years." 30/

Service Work. There are special pressures in jobs which involve responsibility for people (rather than things), notably in the health and medical industries and in social services employment.31/

Customer service representatives for banks, utilities, public agencies and insurance companies are in constant contact with clients, frequently handling complaints. Women office workers rarely have the authority to make decisions which could solve the problem. Bureaucratic procedures and rigid production quotas are often imposed.

> In November, 1979, the new computer system of a Cleveland insurer proved a disaster, making it impossible to process many transactions. All vacations were suspended and employees had to work overtime for several months to handle increased calls from worried and angry policy holders. Today, the company is still millions of dollars behind in claims payments, the employees are still working frantically, and the computer problems remain unsolved.
>
> Janet, a customer service representative who answers the phone all day, says: "You want to help the people calling in, but there's nothing you can do. The management won't even tell us what's going on. So we can't tell customers who are upset anything to calm them down. They scream at us, they might call you every name in the book, but if you even pause for a second to recover between calls, the management is on your back -- 'Answer the next phone call, etc...' They (the company management) use automatic call distributors for everything. If you go to the ladies' room, it's 'Where is she?' 'Why aren't you at your desk?' 'How many calls have you handled?'"

Discrimination as an "Institutional Stressor." The cumulative effect of experiencing discrimination on the basis of sex, race, age or combinations of the three, amounts to chronic stress for many women office workers. Such discrimination manifests itself on a personal level, on an institutional basis -- in longterm denial of promotions and training, and in crisis events such as being fired, threatened with dismissal or urged to take early retirement.

> L. is 55, has raised six children single-handedly, and still supports one. She is a senior sales coordinator for a manufacturing firm in Cleveland, a job which she does meticulously. "It's such a sexist company," she says. "Work is a constant putdown. The men say things like, 'We need fuss-budgets like you around -- I mean old maids.' I can hardly tolerate the men's language, or their physical advances towards the younger women. I have to defend myself all day long. And I look out for a younger co-worker who gets very upset -- but she never talks back to them, so I end up fighting her battles as well as mine."

> Martha is 43, the sole supporter of six children. She works on the twilight shift from 4:15 to 11:15 p.m. in a branch office of a major New England bank, with one 10-minute break and one-half hour for supper. She has worked for the bank for 10 of the last 12 years, but has only been advanced two job grades in this time. Her supervisor still assigns tasks to her which should only be given to employees in grade 8, while she is now a grade 10. To add insult to injury, a younger employee who is a favorite of one of the supervisors was just promoted over a woman with twenty years of service. Now, morale is very low, at least one worker is leaving and other longterm employees are looking for different jobs. Martha is very angry about the unfairness of the situation. She has an ulcer and has 'heartburn' once or twice each month, finds herself smoking more than she wants to, takes two Tylenol every night and sometimes takes a tranquilizer to calm down and fall asleep.

A black insurance worker in Cleveland observes: "As women and blacks get involved in more areas, the employers seem to devalue those areas. They don't heighten the salaries for those areas, and there's less and less status, so they are still working against us while we're supposedly trying to make some progress." On a personal level, race discrimination at work is always degrading and often heartbreaking, as when a boss refers to a black woman as "Magnolia" rather than by name, or co-workers exclude her from social events in an office. "My children want to know 'why are you upset' or 'how come nobody likes you' or 'how come you always have to eat lunch by yourself?'" says a minority bank employee. "There have been incidents where they'll say, 'Well, Mom, do you want me to come down and have lunch with you?'" 32/

Lack of Recognition/Lack of Respect. Women office workers suffer from a lack of recognition for their contribution to the overall effort, as well as from low pay and unfair treatment. Clerical workers frequently complain that they are "treated like children" or "treated like machines," and rarely granted their due measure of respect.

> "I deal with top university administrators who always seem to need everything immediately. Everthing is on a 'rush' basis, and they expect perfection as well. When I respond to their

demands with a perfect and quick product, they expect it all the time, and don't even think to express any appreciation for a job well done," explains a campus staff assistant. Furthermore, she adds: "The so-called 'support staff' is perceived by the 'Staff' as being 'different'. There are unwritten protocols of behavior prohibiting 'Staff' from socializing with 'support staff' on lunch hours."

Another woman writes: "Office workers are routinely made to feel that they are non-persons in the company structure. Memos are addressed to 'Attorneys, Para-Legals, & Legal Personnel", never to Secretaries. The only event we are invited to is the Christmas party."

Unsupportive bosses or supervision problems often go hand in hand with inability or reluctance to express anger and lack of input into decision-making. Comments from Working Women's survey and follow-up interviews help to illustrate these interconnected causes of job stress. More often than not, women report that there is no means to resolve workplace problems -- grievance procedures are described as "ineffective" or "arbitrary". Among women who have raised problems with the management, an alarming number found they were threatened into "keeping quiet" -- told that their "attitude" might have a negative effect on their next performance or salary review or "encouraged" to find employment elsewhere.

Linda has worked for a very large brokerage firm for many years, for the past three years in Boston. She is the secretary to the office manager and when he is out of the office, it is assumed that she will take over. Her boss is very unsupportive. When she asks to see her job description, he says things like, "I'll get on that" but he never does. Linda feels she should get a raise because she's responsible for the office running smoothly when he is away. But she's been told by her manager "If you don't like it here, leave" in just so many words. In fact, the company makes it very clear that there are many applicants for her type of job, and she was told that they could probably fill her vacancy (if she left) that same day!

R. is 50 years old and has worked for a very large law firm in Boston for the last five years. She feels the main contributor to stress on her job is the lack of any way to air grievances, expecially concerning unfair salary reviews:

"There are no job descriptions and no grade levels... There seem to be no guidelines for salaries -- new people are hired for salaries greater than those with seniority. I have a part-time assistant who earns more than I do!" She continues, "Raises are not handled confidentially; lawyers who have little interaction with an office worker save being located nearby will be asked to give their recommendation for her raise and will therefore have access to her personnel file. Even though the firm's own policy review committee found this procedure to be unacceptable, it's still how it's done... In one case, the letters from a worker's supervisors were excellent, but she was given a lower raise than most due to a 'poor attitude' that was perceived only by Personnel. In short,... your salary depends upon who is asked to provide

your recommendation -- and your recommendation may or may not be shared with you, depending on the wishes of the person writing it -- rather than on your performance..."

About two years ago, 60 secretaries met in the firm's library to make plans to air some of their grievances. Immediately, a memo from the management went out denying them the right to use company space for such a meeting. The memo effectively stopped them but, according to R., interest is stirring again.

Lack of Job Security. With no grievance procedure and no union contract, office workers can be laid off, disciplined or fired at the whim of their boss. This pressure increases in mid-life when age discrimination arises and finding a new job is more difficult. The U.S. Department of Labor notes that job tenure -- years on the same job -- is declining due to the rapid introduction of new technology and the shift towards services employment. In the NIOSH study of Blue Shield's San Francisco offices, half of the clerical employees feared that their jobs would be eliminated within the next five years as a result of automation. 33/

Combined Effects of Stress

Sources of stress interact with one another. The combined impact of a set of problems can lead to strain, whereas any one of the problems might not be stressful by itself. 34/ Potential for job satisfaction, interesting work, good social and work relations in the office, and the ability to decide the speed and methods of work are "mediators" of job stress, factors which "moderate" stressful demands by making the effort worthwhile. When such rewards or support systems are absent, the health risks of stress are greatest.

Job Satisfaction is very important to good health and positive mental well-being. One study found that men who lived longest were those who were the most satisfied during their working life.35/ Job dissatisfaction is now considered by some scientists to be as much of a "risk factor" in heart disease as cigarette smoking or a high cholesterol diet. 36/ Women workers are twice as likely to be dissatisfied with their jobs as men, according to a major study conducted in 1971. The main reason women give is the gap between their expectations and the reality of dead-end jobs.37/

Underutilization of skills is a major problem for working women. A woman office worker's job status often does not reflect her real job responsibilities, years of experience, or years of education. In 1973, about one out of six women college graduates was in a relatively low-paid clerical position.38/ Again and again, older and more experienced women tell of being passed over for promotions, often by young men they have trained.

Being passed over for a promotion is "one of the most devastating events that can occur" to a young or middle-aged professional's career.39/ In the Framingham Study, job immobility -- few job changes over a ten-year period -- was one of three predictors of heart disease among clerical women.

According to Working Women's survey, lack of promotions is the number one source of stress. Two-thirds of the survey respondents said that job training and advancement opportunities need improvement where they work. The ability to keep learning new skills and to have challenge and pride in one's work, is extremely important in reducing stress. 40/

A university employee, L. worked as a department secretary for several professors for 7 years. "I used to get splitting headaches and have trouble sleeping at least a couple times a week. I was tense all the time, frustrated and often angry," she says. Finally, L. was promoted to head a department in administrative services. "I waited two years for this promotion. Since I moved up, I've noticed that a lot of the problems seem to have fallen away."

For the last 15 years, S. has worked for a small family-owned pipe plant. She's worked her way up to coordinator of export sales, a position with a lot of responsibility which she really enjoys. "It's very challenging... There's no routine and I have complete control over my time," she says proudly. The situation seems ideal until she tells you about the open-heart surgery she had a year ago. "I am positive that my heart condition is a result of stress on the job," she states firmly. And in fact, two doctors urged her to look for other work, and one even withheld her medicine briefly in an effort to force her to change her place of employment.

S.'s case shows that finding personal satisfaction in a job is not enough -- a person needs recognition, too, and the chance to keep advancing. All the women in the office are in clerical or -- at best -- "coordinator" positions, while all the men are in sales or management. Eight years ago, the company brought a man in from the outside to be manager of the export department, rather than give the job to S. Later they admitted to her that this was a mistake, and that she could have done the job as well as he. The export manager retired last September. And still, the company refuses to promote S. to manager, even though she is running the department. Tensions are running high as she keeps up the pressure for the promotion, and they continue to resist the change.

Although over 50, S. had no history of health problems save once five years ago when she had to take time out for severe arthritis. The last five years have been a real battle, with clear implications for her health. "I can feel the bad feelings coming on again," she says concerning her health since the heart surgery. "I'm getting all uptight again, and I'm coming home exhausted." Her doctors' only advice is to get out of the job. But S. loves her work and refuses to let the men in management get the best of her.

Demands and Control on the Job. Managers have long been perceived as the people under the most stress. A major study comparing job characteristics with national health data by job title lays this belief to rest.

Professor Robert Karasek of Columbia examined different "men's" jobs by levels of job demands compared with levels of control on the job. "Control" is a measure which includes the degree of decision-making authority at work and ability to use one's skills. Relative job insecurity was added, and finally national health data used to predict risk of heart disease was calculated in by occupation. The study finds that assembly line workers -- under high pressure for "output" but with little control over their work -- are in greatest danger of heart ailments, not managers or lawyers. Men in "active" jobs -- jobs with both high demands and high control on the job do not typically experience as much strain as workers in jobs with high demands but low control -- little influence on decisions, few ways to use skills or gain new skills, and less job security. 41/

FIGURE 3.

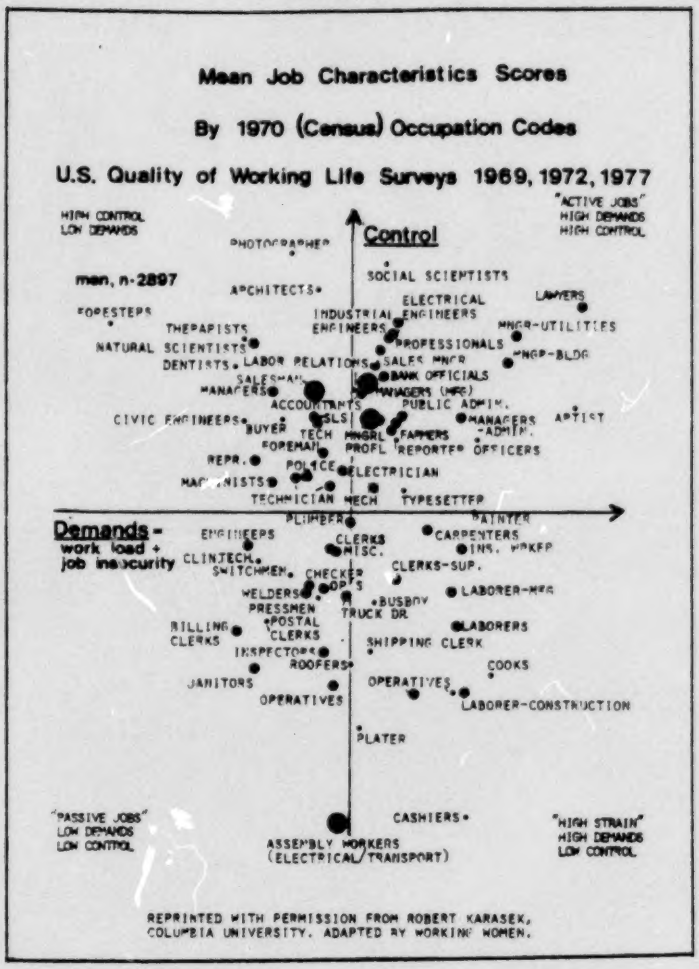


Figure 3. charts men's jobs according to levels of job demands and control, plus relative job insecurity.

"Active jobs" -- with high demands and high control -- are shown in the upper right hand corner or "quadrant", eg. managers and lawyers.

The "high strain" quadrant -- jobs with high demands but low control -- is in the lower right hand corner. The highest levels of job strain are predicted for jobs appearing in this area, for example, assembly line workers, operatives and laborers.

(The size of the dots generally indicates the relatively large or small number of people in a given job, although sizes have been enlarged for the sake of visibility.)

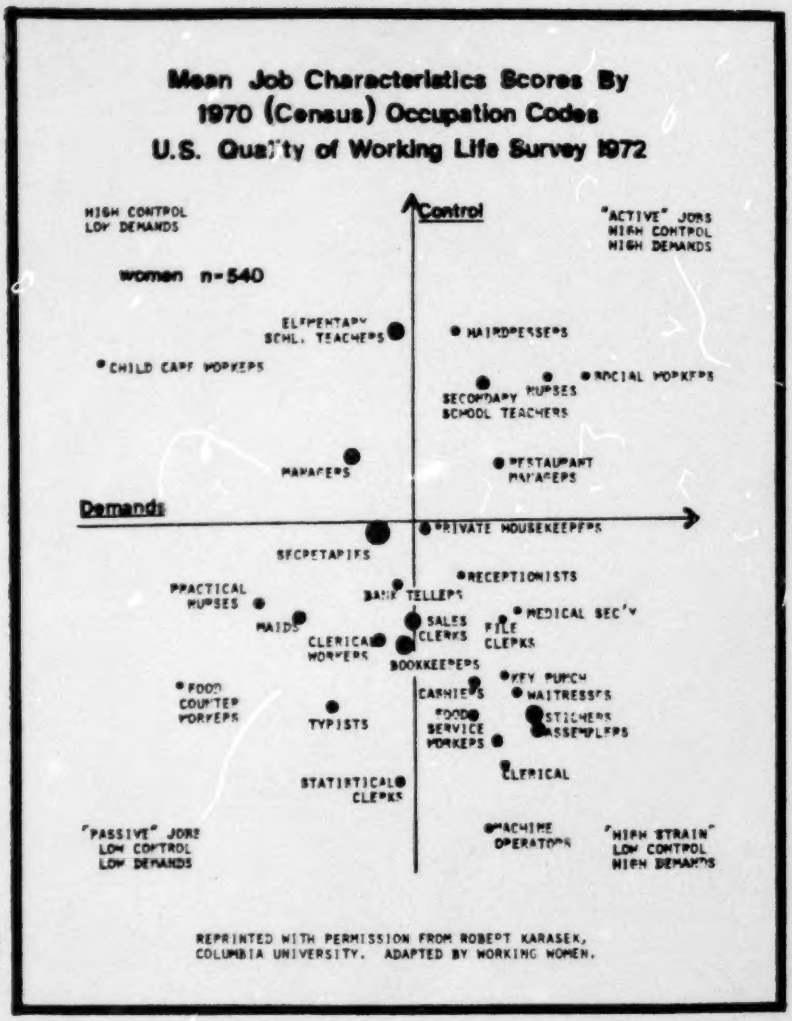
Figure 4. on the following page shows the positions for "women's" occupations by levels of job demands and control. Please note that these are preliminary figures only (for women workers).

Karasek's research also undermines a commonly held belief that "stress-prone individuals bring problems on themselves because of their lifestyle and personal habits." In the study of job demands, job control and CHD risks, the difference in heart disease rate between assembly workers and managers is four times the standard for statistical significance, a much greater gap than can be accounted for by difference in personal circumstances. The findings clearly implicate working conditions in stress and disease. Karasek notes that it's more likely that "the main effects of individual differences are in the effects of stress -- whether a person gets physically sick, gets insomnia, an ulcer or suffers psychological strain. 'Everybody gets some stress.'"

One of the goals of the research is to figure out methods of job redesign which will reduce strain. Toward this goal, Karasek writes:

> "Possibly the most important implication of this study is that it may be possible to improve job-related mental health without sacrificing productivity...for the lowest status jobs the reduction of strain associated with increases in decision latitude (control) is substantial."

FIGURE 4.



REPRINTED WITH PERMISSION FROM ROBERT KARASEK, COLUMBIA UNIVERSITY. ADAPTED BY WORKING WOMEN.

Figure 4. shows results of a preliminary analysis of "women's" jobs by the job characteristics of demands and control only. Relative job insecurity has not been included. Health data will be calculated into each job in research currently underway.

Jobs combining the most intense job pressures with the lowest levels of control over work include telephone operators, bookkeepers, and file clerks, with secretaries and typists very close to the "high strain" quadrant.

Karasek observes that: "...women's decision latitude on the job is much lower than that for men... Furthermore, while men and women report roughly equal workload demands, the combination of high demands with low control -- the high strain job -- is much more common for women (in men the common combination is high demands with high control). Since these jobs are associated with high levels of psychological stress, this occupational concentration may account for the higher observed rates of mental strain among working women, otherwise often implicitly attributed to 'female frailty' or 'excitability'." (Emphasis added.)

Economic Stress

Today two-thirds of all married working women have husbands who earned $10,000 or less in 1979. Among minority working wives, four-fifths are married to men earning $10,000 or less, according to the Bureau of Labor Statistics. In addition, about one in seven women in the labor force is the head of her household.

The majority of women with children under 18 work today. And for all women with children under 6 years old, 45.5% are in the workforce -- 67% among divorced mothers with small children. Author Caroline Bird points out: "Instead of keeping women at home, children of the 1970s were the expense that drove women to earn, for wives with children at home were more apt to be earning than women in general."42/

In 1981, the Bureau of Labor Statistics calculates a low-income budget for a family of four at $12,585; at $11,000 a family of four qualifies for food stamps. And the poverty line in 1981 is $8,450. In 1979, almost 30% of fulltime women clericals who worked year-round earned less than $7,800 and 81.7% earned less than $13,000, according to the Department of Labor.

The lack of accomodation by the business world to the working women's family responsibilities is a further source of stress. Women very often use vacation time to care for sick children. Many child care arrangements do not mesh well with unexpected overtime. Few employers provide support for child care (whose cost averages $50 per week per child). Flexitime, now possible for 20% of the total workforce, is increasing but still available to only a tiny percentage of clerical (or production) workers. Job sharing and stable part-time employment with fair benefits are still the exception rather than the rule. A study of part time women workers found that stress levels were lowest among married women part-timers with husbands present and children, and highest among women heads of families with part time jobs.

A recent national survey on mental well-being found a vast difference between women and men. Almost 80% of the men polled said they were in a state of "positive well-being". But only 67% of the women surveyed and barely one in three minority women described their general state of mind as positive. More than half of black women participants reported moderate to severe levels of stress, tension and anxiety, about double the rate for all women. The same study found no difference between men and women at the upper end of the income scale. The conclusion: the differences are not sex-based, but reflect socio-economic status. 43/

Recognizing and Reducing Stress.

If the causes of office worker stress can be categorized as environmental, job design, employer/employee relations and socio-economic problems, an effective program for stress reduction for office workers will seek to alter these factors. Occupational mobility, a say over working conditions, economic security and relief from the most severe environmental and ergonomic stressors are important to office worker wellbeing and good mental health.

Some employer-sponsored approaches to stress, often going by the name of "stress management," have as their primary goal the protection of productivity. As a result, they may fail to protect the worker. This approach may build one's "tolerance" to stressful conditions, but provides no relief from the sources of stress. To protect the health of the workforce requires strategies to eliminate the causes.

At the same time, eradicating the sources of job stress for office workers is a longterm task. A complementary balance must be struck between moderating the effects of stress on the worker and eliminating stressors from the workplace.

Moderating Stress can be defined as reducing adverse health consequences or offsetting negative conditions with positive conditions or activities. The three keys to moderating job stress are increasing input into decision-making, increasing job satisfaction and increasing social support. 44/

Individual methods. Better diet, more exercise and improvements in lifestyle are certainly important to good health. But these are probably not adequate or realistic remedies for millions of workers at the most risk from job stress. One writer speculates that if toxic fumes and noise, excessive supervision and harassment, rigid work rules and speedups or job insecurity are at issue, "industrial psychologists may not be able to persuade the average ... worker that an hour of jogging a day" is the solution to workplace hazards, even though it's surely a good thing to do. 45/

Assertiveness training, by teaching individuals to voice their views and negotiate with peers and authority figures,can be an effective way to promote constructive approaches to job problems including stress.

Strategies for Reducing Stress. Because workplaces and individuals vary, it's important to identify the sources of stress at play in a particular job, department or company.* However, some common strategies for reducing job stress for office workers can be described: 46/

- Environmental. Reduce noise, improve ventilation and lighting, remove toxic chemicals from use, provide a lounge area for rest and social interaction.

- Job Design. Redesign jobs to allow more variety, provide adequate rest periods and job rotation, opportunities to learn new skills, increased job decision latitude, increased control over workload and pace, realistic production standards.

- Employer/employee relations. Change the style of supervision and train supervisors in human relations, provide respect and recognition, effective grievance procedures, implement fair and non-discriminatory promotion and salary policies, increase workers' participation in decision-making.

- Socio-Economic. Include mental health counselling coverage in benefit package,accommodation to the needs of the working family - such as flex-time and child care, support for continuing education, access to advancement and training opportunities, improve pay and benefits, increase job security.

Methods of stress reduction may require organizational representation, and/or assistance in organizational efforts, among clericals. Because most office workers generally do not have unions, less formal support groups are a necessary route to reducing stress. Assertiveness training, organizing skills, assistance in approaching and "negotiating" with management are all skills which office workers will need to make changes in their work environment. Many unions have formed special committees or task forces to address stress as part of their health and safety activity.

In summary, the role of chronic job stress in physical illness and psychological strain is very complex. Physical and emotional responses to stress are not neatly separable but build on one another. Although it is not possible to say exactly how particular stressors on the job lead to particular health problems, there is enough evidence to guide us in figuring out strategies to reduce and eliminate stress from women office workers' jobs. The research findings that we already have make it clear that steps to eliminate stress in the office need to be taken now, even while more research is underway.

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* The Office Workers Stress Test, available from WORKING WOMEN, is designed to help recognize and evaluate stress.

CHAPTER III: VIDEO DISPLAY TERMINALS

By 1985, more than ten million people will use video-display-terminals (VDTs) at work. Observers estimate that a new VDT is installed every thirteen minutes, and experts predict that 10% of all workplaces will have at least one display unit in the near future. 1/ They are already used extensively in banks, insurance companies, law firms--in any industry where large secretarial pools are employed.

In 1979-80, the NIOSH conducted a study of video display terminal operators at the request of a coalition of labor unions. Five worksites were examined, including newspaper offices and the clerical departments of Blue Shield in San Francisco. Eighty to ninety percent of the clerical VDT operators experienced eye strain or muscle strain. High levels of anxiety, depression and fatigue were reported by VDT users at all of the worksites. 2/

The NIOSH research team found that VDT operators in strictly clerical type operations showed higher stress ratings than any group of workers NIOSH has ever studied including air traffic controllers.

Clerical workers using VDTs were compared with a "control group" consisting of office clericals doing similar work but with pen and paper, conventional typewriters, and with professionals using terminals--mainly newspaper reporters and editors. All of the clericals reported high levels of anxiety, confusion, depression and fatigue, as well as very high rates of physical health problems. The "VDT clericals" experienced the highest levels of job stress, while the "VDT professionals" had reported the lowest stress levels with the "control clericals" in the middle. A vivid description of the differences in working conditions for the clericals and professionals follows:

> "When the job features of the various groups are examined we see that the clerical VDT operators held jobs involving rigid work procedures with high production standards, constant pressure for performance, very little operator control over job tasks, and little identification with and satisfaction from the end-product of their work activity. In contrast to the clerical VDT operators, the professionals using VDTs held jobs that allowed for flexibility, control over job tasks, utilization of their education and a great deal of satisfaction and pride in their end-product. While both jobs had tight deadline requirements, the professional operators had a great deal of control over how these would be met. In their case, the VDT was a tool that could be used for enhancing their end-product, while for the clerical VDT operators, the VDT was part of a new technology that took more and more meaning out of their work. It's not surprising that the professionals using VDTs did not report levels of job stress as high as the clerical VDT operators...This suggests that the use of the VDT is not the only factor contributing to operator stress levels and health complaints, but that job content also makes a contribution."

Health Symptoms Related to VDT Use

Conclusive information on the long-term effects of VDT use will take years to obtain and analyze, but the short-term effects are already well documented even though the causal mechanisms are not yet understood: eye-strain; headache; short-term loss of visual acuity and changes in color perception; back, neck and shoulder pain; fatigue; stomach aches and vomiting.3/

Health symptoms may result from problems in machine, workstation, office environment or job design, or a combination of these. Eyestrain is often worse for employees doing "terminal intensive" work--looking at an "interactive" terminal all day or looking back and forth between hard copy and a screen continuously. Muscular strain in the neck, shoulder, back, hands and wrists is often worse for data entry workers who do not look at the screen as often, but must adopt awkward set postures to work at top speed for hours on end.

Eyestrain, postural problems and musculo-skeletal problems are aggravated by poor lighting, uncomfortable chairs, mismatched chair, desk and keyboard heights, lack of workspace, humidity, temperature and air quality problems, bright, shiny surrounding walls and surfaces which maximize glare, and a general lack of adjustability afforded the office worker(s) using VDTs. When an office worker's chair, keyboard and screen, and lighting are all unadjustable, it is she who must do all the adjusting. The result: a set of problems which compounds the stressfulness of the job and threatens one's health.

> Kathy and Susan work as reservationists for a travel agency. They have both worked there for a year and a half in jobs paying less than $8,000 a year. They spend their full day at VDTs making reservations, looking back and forth between paper and the screen. The terminals have brown screens with orange letters. According to Kathy, "There is terrible glare off the screens because the lighting is so bad. The machines sit on white formica tables which makes the glare even worse. We have headaches at the end of every day..."
>
> Both women wear glasses, and say that working at the terminals has caused their eyesight to deteriorate.
>
> Another woman, B. spends about half the day at the display screen and has been on the job several months. She says her vision has worsened, becoming more myopic, due to continual focusing on the screen. A co-worker went from perfect vision to nearsightedness and had to get glasses for the first time. All four of the women report upper back and neck pain from craning to look into the screen. B. says that when she works at the screen for more than four hours, she comes home feeling more drained of energy than usual.
>
> They feel that something must be done about the glare and the lack of adequate rest breaks.
>
> "The company only allows two ten minute breaks, and thirty minutes for lunch. But what's worse is that you cannot take these breaks when you need them. They must be taken at a time specified by management, and if you're on the phone taking a reservation when the time comes, you lose your break!"

Machine Problems. Although improved equipment is available, there are still a great many low quality models on the market and in use. Frequent problems with machine design include: "nauseating colors" especially fluourescent green; "low resolution" images which lack contrast from background color or generally lack clarity; characters that are too small, too faint or otherwise difficult to read; overly flickering images due to an inadequate "refresh rate" in cheap machines or inadequate maintenance and replacement of cathode ray tubes; shiny keys and casings designed to look "space-like" without regard for the excess glare they cause the user; keyboards attached to screens which can't be adjusted for viewing distance or angle. Since anti-reflection filters are optional components for purchase, they are too often overlooked in the name of office economy.

Lighting problems are probably the biggest complaints from display screen users. Work at VDTs is very demanding visually, much more so than reading newsprint or a book for the same amount of time. One study found that under laboratory conditions, 50% of the subjects reported a burning sensation in the eyes, 33% reported headaches, and 25% experienced flickering vision. The study found that the operators experienced a 50% deterioration in visual clarity, especially severe after four hours of uninterrupted use. 4/

The problems caused by VDT work are increased by lighting conditions designed for traditional office work, according to Swedish scientist Dr. Olav Östberg. Östberg estimates that typical office lighting will cause discomfort for about half of all VDT users. Office workers often find that they need to wear tinted glasses to reduce glare. A combination of more subdued overhead lighting and adjustable "spot-lighting" for copy or "input" is helpful, but not always readily provided.

> Priscilla is a word processing specialist. She used to work for a financial corporation, "stuck in the corner" of a poorly lit, noisy area. The only lighting was overhead, fluorescent and unadjustable. She requested a desk lamp and waited for two months. When nothing happened, she refused to work until the company got her the lamp. She stayed out of work for two days, finally got the lamp, but then she had to work overtime to make up the time she lost. Priscilla's eyesight worsened. She had to get stronger glasses due to continuous work at the word processor, under poor lighting conditions. When she brought this to management's attention, they admitted it was work related but refused to pay for her eye exam or new lenses. Finally, she left for a job with better pay, fewer hours, and less stress.

Workstation Design. As much flexibility as possible should be provided. Work spaces should not be overcrowded so that build-ups of heat, noise or stuffy air are avoided. Chairs and desks should be adjustable since office workers themselves come in all different heights.

> A. works in the resources department of a large university. She works on a Wang word processor about 3 or 4 hours per day, and does a variety of work at the terminal, entering and editing documents for four writers. Overall, she feels she enjoys working with the word processor as an aid in her job. However, she has several complaints: 1) Her neck and shoulders often ache. The screen is attached to the keyboard and she is tall. Even though the keyboard height is comfortable, she has to hunch down to see the screen. On rare occasions when she has to type all day, her body aches all over. 2) A. describes the lighting--two fluorescent lights directly overhead--as "terrible." She faces a white wall, which increases the glare. She has permission to correct the lighting problems, but must spend her own time and money to arrange for changes.

Office Environment. Altogether, office environments reflect too little attention to the comfort of the office workers who must sit in them all day. Appearance and fancy new equipment is unfortunately more important to some managers than their employees' state of health.

> Three women who work for a small accounting firm at a prestigious downtown location comment on the high turnover rate in their office:

"I've been there almost a year, and I've got seniority among the secretaries," Emily says. "It's the strain--everything must be done under the deadline, it always absolutely has to be done by 9:00 the next morning. We end up rushing around like crazy to make up for their delays in getting the job done so it can be typed. We are forever getting in early and there's staying late in order to use the word processor while no one else is waiting for it. We're just extensions of those dumb machines."

Her co-worker agrees, and adds, "You know, when the boss brings new clients through the office to show them around, he'll point right to me working at the word processor and say, 'Here we have our wonderful new LEXITRON' and then move right on. He doesn't bother to introduce me--just the machine!"

All three women experience almost daily headaches, nervous stomachs and shaky hands. They're upset that another one of the secretaries who has high blood pressure, was recently sent to the hospital for tests. Their employers don't seem to care: "The place looks gorgeous, and that's where the management's priorities lie. They're not really as interested in efficiency as they are in using people up and pushing them out the back door."

When improvements are made, office employees who will be using the new equipment should be involved in choice of machines and redesign of their work areas. A VDT operator who is a member of The Newspaper Guild says:

"I work at a terminal all day. When the union pushed the newspaper company where I work, they improved the colors and lighting and all that for the fulltime operators. Now they have a new set-up called "the open office". There are dark blue panels six feet high around all the operators. In many cases, we don't see another person all day except for a ten-minute break and lunch time. All we see is the walls around us and sometimes the supervisor. The isolation is terrible."

"'Comfort' is the best guide to follow, and a high degree of flexibility," advises Tobi Berman of the New York Committee for Occupational Safety and Health (NYCOSH). "People need to be involved in redesigning the work area to make sure it is still pleasant and comfortable for them after changes are made. There's a need for a high degree of adjustability--chairs that can be adjusted with an allen wrench, keyboards that are detachable. But in many cases what we see is that the desk is so crowded or the workspace so small that the keyboard or screen can't possibly be moved without falling off the desk. It doesn't solve anything if the keyboard is detached but you can't adjust the distance because you don't have any room."

Visual Strain.

A recent study in Vienna found that clarity of visual focus did not return to normal for more than 16 minutes after four hours of work at a display screen, even with a 15 minute break. The Viennese government therefore proposed a limit of four hours work at a screen per day with a 15 minute break after two hours. 5/ The vision of terminal operators undergoes short-term changes described as "minor" by the U.S. NIOSH. But the agency expresses concern that these temporary changes may indicate "the potential for chronic effects given longterm CRT use." 6/ An

industrial hygienist warns that VDTs "exaggerate the deficiencies in vision or any defects in the eyes".

> Anna works for a non-profit technology research center as an all-around secretary. A year and a half ago, she worked briefly in a fulltime word-processing position: "By the end of three months, working at the word processor, I developed a very frightening eye syndrome. I never had eye problems before and I've never even worn glasses. But I found that when I went from a lighten room into a dark room my eyes could not adjust--it took a full minute. I went to an Eye Clinic. The doctor said my eyes were generally fine, but they were being strained in a very bad way by my work at the machine. He advised me that if I wanted to continue in that job, I would need to take a 10 minute break every 20 minutes and focus on a faraway point. He warned me that if I couldn't do this, I had better quit or my eyes would continue to deteriorate. When I told my supervisor what the doctor said, she said 'Do whatever you want, but just get the work done!' I knew there was no way I could keep up if I took the breaks the doctor advised, so I quit after 4 months. My eyes have returned to normal, and I don't have any vision problems in my current job."

Fear that display screen viewing may cause permanent eye damage stems in part from an incident at the N.Y.Times in 1977 when two young male employees developed cataracts after working continuously at terminals (see section on low level radiation).

Office workers who wear contact lenses have even more difficulties with itching and burning eyes, especially if their offices are also too hot, too dry or smoky. And wearers of bifocals also have special problems, they must adopt extreme postures to view the screen.

"The computer is the Ultimate Unsupportive Boss."

The introduction of VDTs and other automated equipment intensifies the pace of office work in the name of productivity. Monotony and boredom increase. Operators complain of being "constantly watched" by the computer. Fear of job loss through automation is an added cause of stress. Unless the effects of computer-based systems on people are considered, NIOSH warns, such technology will become "a source of misery instead of a helpful tool." 7/

A comparative study of general clerical workers and VDT typists found that the latter experienced extreme fatigue, alienation, monotony and lack of challenge in their jobs at twice the rates of traditional clerical workers. Symptoms of stress and increasing job dissatisfaction were most prevalent among "computer-controlled" typists paid according to piecework, and "de-qualified" office workers, who were transferred from more varied clerical jobs into fulltime VDT work. 8/

> When Rose reentered the workforce last year, her excellent typing skills quickly landed her a job with a downtown Cleveland publishing company -- as one of 12 CRT operators working in a small crowded room. She found office work had changed a great deal during her years away from the workforce. "The chairs were good, expensive chairs, and the machines themselves were adjustable, too. But I have never been confined to one place doing key entry at such a pace." She explains, "The computer at one end of the room keeps track of how

many key strokes per minute you do. The more key strokes, the more money you might get. At the end of the day the figures were posted. You look at your speed, you look at everyone else, and you say, 'Tomorrow I'm going to do better.' They get you thinking just like they want to, you're really pushing hard."

"I was often totally disoriented during the first two months. ...One day --I'm not just telling you this to be dramatic -- I was sitting there at the terminal, entering data, reading from the screen, and I suddenly thought I was having a terrible nightmare. I didn't know where I was. It took all the discipline I had to sit there quietly, until the whole thing passed. I knew something was wrong and I was frightened. But I didn't understand what happened to me until I read about office health and safety in Cleveland Women Working's newsletter. As I understand more, now I feel like I can do something about it."

Rose changed jobs, and now works in a less hectic, conventional office. The strain of extremely fast-paced and contolled work at display screens does not only affect employees who once did traditional office work. Rose describes a co-worker at the publishing company: "One girl who is also a CRT operator came to the company right after high school. She's been running a CRT for close to ten years, and she's as fast as the wind. But it's really affected her personality. I used to wonder if something was wrong - she had no exuberance. Once she said to me, "Rose, as soon as I sit down at that machine in the morning I feel like I'm going to cry."

Low-level Radiation Emissions.

The original health concerns of workers on video display terminals had to do with the issue of radiation. Early NIOSH studies looked at the cataractogenic potential of VDT's, finding that radiation emissions by VDT's were below federal threshold standards. 9/

A grievance filed by the Newspaper Guild prompted a 1977 study by NIOSH of the potential radiation dangers of VDT's. Two newspaper employees who had worked continuously on VDT's developed bilateral, posterior cataracts (the type caused by radiant energy exposure). Most regions of the electromagnetic spectrum have been implicated as being cataractogenic. 10/ Although NIOSH found that all categories of radiation emission by VDT's were below threshold standards, the etiology of the employees' cataracts remained undetermined. The type of cataract observed has only four known causes; neither man had any medical history pointing to the other three causes. 11/

Many employees and labor officials fear that long-term low-level radiation dangers from VDT's will be proven 15 or 20 years from now. One Newspaper Guild official told Working Women: "This whole thing may end up like Three-Mile Island. We won't know the damage for another 10 or 20 years." The Newspaper Guild and Mt. Sinai School of Medicine have launched a long-range study of the health effects of VDTs which "should begin to provide a definitive answer as to whether VDTs produce cataracts or other damage to the eyes as well as answer persistent questions about other possible effects of radiation..." 12/

Manufacturers could use substitute technologies (which they already have developed) to remove CRT-based display screens from the workplace, eliminate this source of concern and avert potential health hazards. 13/

An excellent readable guide to proper lighting standards, workstation design, and criteria of high-quality equipment is available from the New York Committee for Occupational Safety and Health, called Health Protection for Operators of VDTs/CRTs. Important points about machine and workstation design include:

- Screens should be detached from keyboards so they are adjustable.
- Screens, keyboards, and room decor should be in mat, subdued colors to reduce glare; conventional office lighting should be redesigned.
- Look for "high resolution" screens, proper size, color and clarity of screen characters.
- Screens should allow individual operators to adjust angle, brightness and focus for viewing comfort.
- Too often, devices which reduce glare and/or noise are optional -- make sure they are purchased.
- Regular maintenance and repair are essential.

Only high quality equipment should be used, and flexibility should be built into programming and systems design. Automation in the office has the potential to reduce rather than increase stress if the following job design principles are followed:

- New technology should mean you use more skills in your work, not fewer and that promotional opportunities are increased, not reduced.
- New office technology should mean more control over the pace and organization of work, not less control.
- Increased productivity should be compensated by increased pay, more breaktime, and/or a reduction in weekly hours without a reduction in pay.

The risks associated with VDTs can be reduced while further research is in progress. Improved machines are already available for purchase. A writer for a management research firm notes that protections against operator discomfort "are to a great extent within the control of the office manager." 14/

Adequate rest periods and job rotation are the key to protecting the health and well-being of video-display terminal operators. The NIOSH recommends a 15-minute break per hour of visually intensive work and 15 minutes per two hours of continuous work at a VDT to reduce eyestrain and stress. In other countries, limits of one and a half hours continuous VDT work and/or four hours per day have been recommended or mandated. 15/

IV. OFFICE AIR QUALITY AND VENTILATION PROBLEMS.

"We always thought people got 'Monday morning sickness' because they didn't like coming back to work. Now we're realizing that it may be because they're coming into an environment that's an irritation to their system," explains Craig Hollowell, Director of Indoor Air Quality Program at the Lawrence Berkeley Laboratories.

Energy conservation, new building and furniture materials (particularly plastic-based synthetics in furnishings and either chemical or paper-based insulation materials),office supplies and machines which emit fumes, the "weatherless" office with its sealed windows, and improperly maintained or faulty ventilation systems that can recycle infectious bacteria, dust, smoke and harmful airborne chemical contaminants throughout a building -- all of these factors are causing an explosion of concern about office air quality. "There's probably more damage to human health by indoor pollution than by outdoor pollution," says a scientist for the World Health Organization.

The effects of poor office air quality range from fatigue, lethargy, headaches, and mucous membrane irritation or skin rashes, to nausea, colds bronchitis, increased stress and menstrual irregularities, to longterm respiratory diseases. Some airborne toxic substances, such as asbestos or ozone can lead to blood diseases, or possible mutagenic damage or cancer. Many others, such as methanol and organic solvents, can cause "a drunken state", blurred vision or nervous conditions.

So many outbreaks of building-related health problems have occurred in the past few years that scientists coined the term "Tight Building Syndrome" to describe these "mystery illnesses." Perhaps as many as 30% of all requests for on-site health evaluations received by the NIOSH last year involved office workers.1/ In only a few cases has the agency been able to find a chemical "cause," but faulty ventilation plays a major role as does stress. Employers have been forced to recognize the dangers of poor air quality in "sealed" buildings because large numbers of employees have become too sick or too drowsy to work, many have called in public health officials, and some employees have walked out of their offices in protest. 2/

"Sealed" Buildings. Poor ventilation is a key environmental contributor to air contamination. Office machines such as photocopiers, specialized printing, duplicating and new "signature-writing" machines are often located in small, windowless rooms or in closets to reduce office noise. This only increases the dangers of accumulating toxic concentrations of byproducts such as ozone, methanol, formaldehyde and aromatic hydrocarbons. If the exhaust flows into an air-conditioning system rather than to the outside, the air contaminants can be recycled throughout the entire work area.

"Sealed" older buildings and newly constructed "energy-efficient" buildings pose more problems for office workers. An inadequate supply of fresh air means that the percentage of oxygen in the office air declines. Lack of fresh air can produce headaches, make one drowsy or faint, and can interfere with concentration.

Health and Safety Fact Sheet

Hazard	Effects	Prevention
Stress, from lack of job satisfaction and job mobility; repetitive, demanding work; discrimination or harassment; noise, muscular or mental fatigue.	Chronic stress has been linked to hypertension, migraine headaches, insomnia, extreme fatigue, ulcers and heart disease.	Improved working conditions, greater control over job tasks, more rest breaks, group discussion and action on problem areas and solutions.
VDTs/CRTs, continuous use, improper lighting, glare, improper workstation, poor machine design, overly small or flickering images; low level radiation emission.	Eyestrain, short-term loss of visual clarity; headaches, neck and back pain; dizziness, nausea; job stress.	Frequent rest breaks and job rotation; adjustable chairs, lighting and screens; detached keyboards; regular eye exams; improved machine design and care.
Poor air quality and ventilation, "sealing-in" and recycling toxic fumes and vapors, dusts, spores or bacteria, or asbestos particles. Temperature and humidity problems.	Colds, fatigue, bacterial infection, respiratory problems. Asbestos is a potent cancer-causing agent.	Increase air exchange rate and fresh air supply; clean circulation systems. Immediate removal of asbestos if exposed during renovations in offices built with asbestos insulation (esp. 1958-1970).
Toxic substances, such as **ozone** from photocopiers; **nitropyrene** in toners; **methanol** from duplicators; **solvents** in stencil and correction fluids and "erasing" compounds.	Eye, nose and throat irritation; coughing; headaches, drowsiness. Long term exposures may lead to permanent damage.	Well-ventilated areas for all machines; control of ozone levels below OSHA limit (0.1 ppm); replacement of hazardous products with safe substances.
Noise, lighting and chair design — excessive noise, poor lighting, crowding, constant sitting in badly designed chairs.	Headaches, irritability, anxiety; stress, potential hearing damage, eyestrain; back pain and varicose veins from constant sitting.	Carpeting, room dividers, machine shields to reduce noise; adjustable lighting, elimination of glare; adjustable chairs providing back support.
Accidents, caused by slippery floors, overcrowding, poorly secured or designed furniture, obstructed passageways, deadline rush, insufficient fire protection.	The Department of Labor estimates a rate of 40,000 disabling injuries and 200 work-related deaths in offices every year.	Maintenance of safe, non-obstructed passageways; well-designed, secured equipment, chairs and file cabinets; fire precautions.

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Air exchange rates of 15 to 20 complete changeovers of fresh air per working day are recommended. Dr. Hollowell of Berkeley Laboratories found that "a new energy-efficient structure typically allows but one air exchange every 10 hours." 3/In buildings where smoking is permitted, five times as much ventilation is required to remove the soot, carbon monoxide and benzopyrene released. NIOSH researchers have found that increasing air exchange rates per day goes a long way toward relieving symptoms.

By closing off exhaust ventilation and cutting down the movement of air inside, the indoor equivalent of "smog" is born. Air refresheners, solvents, adhesives in building products, cleaning fluids, fire-retardant chemicals, chemicals which prevent aging of paints and finishes -- all these are trapped inside. "We may be transforming offices into virtual gas chambers," says Dr. George Burch of Tulane University Medical School. 4/

> In September 1979, 150 employees were evacuated from the Itel Corporation's brand new building in Port Washington, N.Y. Days after moving in, reports of headaches, nausea, lethargy, stuffy noses, puffy eyes and dizziness became so widespread that employees were temporarily relocated in trailers. Investigators from the Federal Center for Disease Control concluded that they were "poisoned" by emissions from copiers, typewriters, rugs, furniture chemically treated wallpaper and cigarette smoke. It cost Itel only $5,000 to improve the building's ventilation and make the office "liveable" again. 5/

Ventilation and air quality are often worst around clerical workspaces, since clerical workers are usually located farthest from windows, even when a window can be opened. And, in most cases, they are closest to and spend the most time using office machines which emit fumes.

> Jane works as an insurance policy examiner in Boston. At least half of the women in her department have developed eye problems since the company moved into a new building two years ago. Most describe it as a "gritty feeling in their eyes" and use eye drops 3 to 4 times a day to relieve it. The work is visually demanding as almost everyone works at a VDT.
>
> Jane has lost the ability to produce tears and must rely on a tear replacer. She gives an example of what this means: if an eyelash or foreign body gets in her eyes, she doesn't have the tears to wash it away, and it has to be removed with a tweezer!
>
> "I've spent all kinds of time and money running back and forth to eye specialists because after the irritation starts to get out of control, I get allergic conjunctivitis. We assume these irritating fumes are from a lack of fresh air, not changing air filters often enough, and the use of photocopying machines. Smoke hangs in the air like a cloud. 'Management' states that there is nothing wrong with the air, yet everyone who goes to their ophthalmologist hears the same thing: 'It's from the building.' "

When Jane raised the problem with the management, she was told her "complaint" would be entered on her work record under a section called "attitude" which could affect her annual salary review. Most of the department policy examiners are minority women, many cannot speak English and are convinced that no one else will hire them and are afraid to risk losing their jobs by going to management together. Jane is reluctant to call in health officials because as the only one who has complained her anonymity can't be protected.

Temperature and Humidity Problems. Allergic reactions, fatigue, colds, respiratory problems, dry skin, and general discomfort can result from poor humidity and temperature controls. Too much or too little humidity can compound eye irritation from pollutants, adding to the strain of intense visual work. The effects are often worse for wearers of contact lenses.

> Geri has worked for the Social Security Administration in Cleveland for 13 years as a data review technician. One immediately senses "dead air" when walking into any one of the 35 floors of the federal building. Uncirculated, hot air is made worse by smoke and dust and windows that are sealed to outside air. The dust-attracting carpets are vacuumed twice - literally twice - per year. Of the 60 employees in her section, at least six, including Geri, have developed sinusitis, a painful and chronic sinus condition. Geri has seen a doctor for the condition every two weeks for the past five years. She is on almost constant medication.
>
> R. works for one of Boston's biggest banks. For the last five years, she worked as a clerk in a basement area nicknamed "the vault" by the 50 people in the collections department. She developed pleurisy --a painful inflammation of the inside one's lungs -- from exposure to drafts of cold winter air blown into the work area through the bank's revolving doors. Once she catches a chill and contracts the illness, it can take up to four days to recover. On some days, she has gone to the company nurse to lie down on a heating pad to relieve the chill and pain. Last year, R. lost 14 days of work due to pleurisy. Several days were taken without pay, and she lost her eligibility for a raise.
>
> A year ago, a co-worker contacted the Board of Health. The bank was given six months to solve the problem, but they did nothing. The Board never followed up to enforce the recommendations.

Organic Pollutants. The classic case of health effects involving biological agents indoors was the Legionnaire's Disease in the hotel in Philadelphia. Now several other organisms and allergies have been identified and associated with workers in offices. Hypersensitivity pneumonitis -- also called "humidifier lung" may appear to be flu, but is caused by bacterial infection. Primary sources of these organisms are cooling towers or evaporative condensers and humidifier reservoirs.

Scientists who investigated a large office complex of 4,000 employees found 50 cases of hypersensitivity pneumonitis. They estimate that such infections happen often, affecting from 3% to 16% of those exposed in a given office. These risks are increased in large-space offices with forced-air circulation systems.6/ Insulation material based on organic compounds such as newsprint can also provide breeding grounds for bacteria and spores.

Toxic Contaminants in Office Air

Sources of office air contaminants include exhaust fumes of office machines and special printing processes, vapors from common office products, nearby laboratories or industrial processes, outdoor pollutants drawn inside and asbestos fibers loosened from insulation in older buildings. There are more than 20 possible airborne irritants under study in relation to office workers' health complaints. 7/

Several guides are available which provide information on symptoms, effects, legal limits of exposure, and levels of exposure which cause health symptoms. A few of the most prevalent and potentially dangerous toxic hazards found in offices are described below.

Photocopiers. There are at least four types of hazards associated with photocopying machines: 1) ozone in exhaust emmissions; 2) dangerous chemicals in toners such as nitropyrene; 3) chemicals used in the photocopying process, such as trinitrofluorenone; and 4) potential exposure to ultra-violet radiant light.

Ozone. A NIOSH pamphlet urges that unnecessary exposure to any concentration of ozone, however small, should be avoided. Exposure to low concentrations depresses the nervous system and produces drowsiness. Prolonged exposure to ozone in an immediate work area without adequate ventilation can cause permanent lung damage. 8/

Photocopying machines, electrostencil machines, and electric typewriters emit ozone. One study found that in a poorly ventilated area, a health risk could occur when 83 photocopies were made over a two-hour period. 9/ Proper machine cleaning and maintenance reduces risks, but further study is needed.

> Anita Reber works as a secretary in Philadelphia. Formerly, she was a secretary for Sperry-Univac Corporation. In the fall of 1980, Anita won a Workers' Compensation claim from Sperry to pay the medical costs of permanent sinus and respiratory damage resulting from working close to a photocopier. (The particular machine model was recalled in 1976.) Recently, she testified before the House Subcommittee on Health: "For a year and a half, I worked three feet from the copier with the exhaust facing me...It go so bad, I felt like I was being poisoned...It's important that I have won a Worker's Compensation claim...but I cannot place an order for a new pair of lungs and I cannot wipe the worried look from the faces of the members of my family when I can't breathe, can't stop coughing, when I have to sit up to sleep..." 10/

Nitropyrene is a contaminant found in carbon black, a component of toner products. Nitropyrene proved carcinogenic and mutagenic in bacteria tests performed on Xerox and A.B.Dick toner in 1979 and 1980, and is suspected as a cancer-causing agent for humans.11/ Although the levels of nitropyrene in Xerox toner were reduced in March of 1980, the product was not recalled, so it may still be on supply shelves.

Trinitrofluorenone (TNF), used in certain large copying and computer printing machines, is considered to pose some risk of cancer for human beings, according to the E.P.A. TNF has been used by I.B.M. to coat photocopying "drums" for ten years, and is found in I.B.M.'s 3800 Printer and I.B.M. Copiers 1 and 2. The greatest risk is to repair personnel, but all office employees should avoid skin contact with "used" toner, since traces of TNF are transmitted during the copying process. I.B.M., which has known about the potential cancer risk for ten years, finally recommended that repair personnel wear protective gloves as of November, 1980. According to the trade journal Computerworld, I.B.M. is alone among photocopying manufacturers in using the substance. 12/

Ultraviolet Radiation. Dry copiers, particularly photocopiers, use ultraviolet or infrared light as their light source. Short-term exposure to intense ultraviolet light, or long exposure to low intensity levels, is painful to the eyes but generally, eye damage is self-repairing. Prolonged exposure can cause permanent damage. Symptoms of excessive ultraviolet exposure are frequent headaches, soreness and swelling of the eyes.13/

> Shawn is a senior secretary at M.I.T. Her description of the xerox room in her department is typical in many offices: "The once-large room has been halved, and the xerox room is now the size of a small closet, big enough for a small xerox machine, one small table, and one person. Not until someone fainted this past summer did they install a fan in the wall; however, everyone keeps the door to the room open. The fan blows out into the hallway, NOT to an outside vent. There are fumes in the room, and in the hallway, although more dispersed than before."
>
> The light-flashes in the machine bother her eyes. Even though she looks away, the light bounces off the walls. Also, if one is xeroxing a page in a book, because the cover is not a flexible cover, one has to keep the cover open so it doesn't crush the book.

Photocopiers should be in well-ventilated areas. If necessary local exhaust vents should be installed near machines to remove fumes to the outside. Machines should be regularly cleaned and maintained, and ozone levels should be measured and kept below the OSHA limit. Clerical workers should know what chemicals are in toners and make sure nitropyrene is not present.

Methanol or Methyl Alcohol. A recent study of "spirit duplicators" in the Everett School District found that teachers' aides faced a health hazard due to excessive exposure to methyl alcohol or methanol.14/ A powerful solvent, methanol is used in inks and cements and is a cleaner of photographic film. Chronic exposure at the threshold limit value (200 ppm) irritates the mucous membranes of the eyes, nose and throat; low concentrations can cause headaches, giddiness, insomnia and blurred vision.15/ Persons with central nervous system problems or weak visual acuity should not work where exposure is repeated, according to the National Safety Council.

Formaldehyde is a well-known respiratory and skin irritant. In November, 1980, a special federal panel advised that formaldehyde "should be considered to pose a risk of cancer for human beings," after rats developed nasal cancer when they inhaled doses of the gas within the range of levels encountered by people. 16/

Formaldehyde is a very common industrial material, used in particle board and fire retardants, as a furniture sealant in wood-laminated desks and panels, as a coating for paper in "automatic signature-writing" machines, and in urea formaldehyde foam insulation (UFFI), quite widely installed since 1976. Formaldehyde and acrolein gas can also be released from disintegrating carpets and curtains as they wear down over time.

In greater Los Angeles, 150 women office workers in a new building called in public health officials, complaining of burning eyes, coughing, difficulty breathing and even chronic nausea. An industrial hygienist told the press "formaldehyde gas was flowing from the walls" next to many of the clericals' desks. The gas was measured at 6-7 ppm -- three times the levels considered safe by OSHA.17/

A NIOSH health hazard evaluation at a California school found formaldehyde levels of 2 ppm released from pressed-wood boards used as shelving in classrooms.18/

The National Academy of Sciences recommends that exposure to formaldehyde gas should be reduced to the "lowest possible practical concentration." Although the current standard allows exposure to 2 ppm (parts per million parts or air) over an eight-hour day, symptoms occur at much lower levels. Because irritation and disturbed sleep can occur after exposure to as little as 0.3 ppm of formaldehyde, NIOSH recommends a limit of 1 ppm exposure.

Urea formaldehyde foam insulation was banned in Massachuestts in 1979. In January, 1981, the U.S. Consumer Product Safety Commission proposed a nation-wide ban, noting that "after being installed, UFFI may release formaldehyde gas for weeks, months or even years." 19/

Special Printing Processes. There are additional chemical contamination hazards with special processes. Four recent NIOSH health hazard reviews examined a micro-duplicator and blueprinting operation for ammonia concentrations, an instant copy service for acetic acid and hydroquinone mist concentrations, and an electrostatic copying machine for alphatic hydrocarbons as well as ozone emissions. 20/ In general, the complaints by employees were filed during times of continuous use or when the ventilation system was inadequate. When provisions were made for exhaust control, the problems were generally resolved. However, NIOSH found in the case of the electrostatic copying machine that if the machine were used more than two hours a day, a health hazard would result.

Recently two women left their jobs in the audio-visual facility of a government office in Washington, when they could no longer bear the effects of toxic poisoning from a darkroom-like center next to their office. When air samples were tested, a lab technician remarked that the trace levels of xylene and toluene found were "usually only found outside of a petrochemical plant."

Laboratory or Industrial Fumes. A number of investigations have found fumes from car exhaust (from parking lots under or next to buildings), by-products from combustion processes (such as faulty furnaces) or on-site energy sources (burning gasoline, coal or diesel fuel) and fumes from industrial processes nearby. Cleveland Building Inspector Juanita Jones recalls one incident in the summer of 1980: "A print shop was located on the ground floor, with offices right above it for several stories. The chemical exhaust was issued directly outside, the heated air with chemicals in it traveled up the side of the building and went right into the offices, making everyone sick."

WORKING WOMEN received numerous complaints from staff of universities and colleges with science laboratories and medical schools. The following example is representative:

Laura has worked as a medical secretary at Tufts Medical School for 5 years. "There is a major problem with fumes about once a month. The vapors have been monitored and include benzene derivatives, toluene, xylene, formaldehyde, and acrylates (used to make dental impressions). The fumes from the animal lab's penetrate the ventilation system, particularly the bathrooms, making their use nearly impossible. Fumes from all other floors are picked up by the system and spread throughout the building. At times this involves substances, particularly the acrylates which cause a very acrid smell and taste in the mouth, as well as a feeling of coating the surface of the mucous membrances, especially the nose and throat. Laboratory hoods aren't maintained or fitted properly. And the ventilation system should be re-vamped and improved, as it's a very old, remodeled garment factory."

So far, Laura says her health hasn't been affected except for the sensation of "coating" of the mucous membranes, but she and her family are concerned about possible long-term effects.

PCBs. The manufacture of polychlorinated biphenyl (PCB) was outlawed in 1976 because the chemical is so dangerous. Yet, it is still commonly used as a lubricant and high-temperature coolant in electrical transformers and in industrial machinery. PCB causes cancer in animals and attacks the immunization system of people.

In 1979, 43 electricians who were exposed daily to leaking PCBs during their maintenance and repair work in federal buildings in Washington, D.C., called in health officials. They complained of skin rashes, headaches and fatigue after contact with the spilled chemical. The Washington-based Health Research Group estimates that at least one-third of all federal office buildings in the D.C. area have transformers leaking PCBs., and warns "...Anytime you see some PCB spilled on the floor, the chances are that workers are going to be breathing excessive amounts of the stuff."21/

In February, 1981, a fire in the electrical circuitry of the brand new 18-story Binghampton, (N.Y.) State Office Building released a layer of toxic soot which permeated the entire building. More than 180 gallons of coolant laden with PCBs leaked out of the buildings' electric transformer into the fire, and up to 200 people were exposed to the chemical fumes. Days later, workers performing a routine clean-up discovered that the PCBs combined with intense heat and oxygen produced dibenzofuran and dioxin, one of the deadliest chemicals known. Dioxin, known as "Agent Orange" when it was used as a defoliant in the Vietnam War, has been linked to cancer, is known to attack the liver and nervous system, and can cause birth defects. 22/

Although the incident is believed the first in the United States, authorities said it could happen in most of the nation's large office buildings, since the same type of transformers are commonly used. In 1979, a similar incident in Toronto prompted the Canadian government to ban the use of transformers which contain PCBs23/An international panel of pollution-control experts will propose a safe method for cleaning up the evacuated building.

N.Y.'s Governor Carey sparked a furor when he told the press that the panel was only convened "to satisfy the unions" and cavalierly offered to "swallow an entire glass of PCBs" and clean up the building himself with a vacuum cleaner. Days later, the governor had to swallow his words instead when more information on the dangers of the dioxin and PCB contamination was made public.

Chemicals in Office Products. Other potentially harmful chemicals contained in commonly used office supplies include: trichloroethylene (TCE), tetrachloroethylene perchloroethylene both suspected carcinogens found in liquid eraser products; benzene, a carcinogen, and toluene, a powerful narcotic, found as impurities in cleaning solvents. At moderate levels of exposure to organic solvents workers complain of eye irritation, changes in skin color, and heart palpitations. Several deaths have been connected to the sniffing of a typewriter correction fluid. 24/

Many common office products are also potential causal agents of skin rashes for clerical workers: adhesives, carbon or "carbonless" paper, copy paper, duplicating fluids and materials, inks and ink removers, rubber, solvents, typecleaner, and typewriter ribbons.25/

Since manufacturers of office products are not required to label them, other harmful chemicals may also be in use. It is crucial to obtain information on what solvents and substances are being used and determine their health effects and safe use. Requiring manufacturers to label product contents and requiring employers to post contents and instructions for safe use would be a positive first step.

Airborne Asbestos. Asbestos is a well-documented and severe health hazard. Exposure can cause: asbestosis (a chronic lung ailment); cancer of the lungs, esophagus, stomach, colon and rectum; and mesothelioma, an invariably fatal form of cancer involving the thin membrane lining of the chest and abdomen. The latency period between exposure and appearance of disease may be 20 to 40 years. There is no safe level of exposure to asbestos fibers.26 / The particles are extremely durable and very difficult to destroy or degrade. Fibers remain airborn for long periods of time and are inhaled easily. Particles that are retained in the lungs stay indefinitely. Asbestos exposure at work also endangers the employee's family if particles are carried home on clothes. For cigarette smokers, exposure increases the likelihood of lung cancer 30 to 90 fold.

In buildings, asbestos exposure most commonly occurs when fibers come loose from building insulation and are circulated through ventilation systems. The Environmental Protection Agency, in conjunction with OSHA and D.H.E.W., recently conducted a nationwide educational campaign on asbestos hazards in school buildings. As a result, the E.P.A. has announced regulations and made funds available to schools to prevent asbestos dangers, since it found voluntary compliance inadequate to eliminate the dangers.27/

A study in 1975 estimated that half of the nation's office buildings built between 1958 and 1970 used asbestos for fireproofing.28/ In New York City, dangerously high levels were measured in 20% of the buildings tested in the same study. In 1980, the N.Y. Commissioner of Buildings asked NIOSH to conduct a renewed investigation to assess the dangers of airborne asbestos in the city's older buildings. Recent incidents of asbestos insulation exposure have been reported in Cleveland and Boston's city offices, state offices in Albany and Philadelphia's train station, among others.

Mary works for New England Telephone Company in Lynn, Massachusetts. She shows photographs of the cramped, crowded Record Room, where she has worked for seven years. What is particularly horrifying are the asbestos fibers and dust dropping all over the records and the people who spend considerable time working there, including herself. A year ago, she called the state Asbestos Commission to investigate. She believes that the commission must have called the telephone company beforehand, because by the time they came (2 months after she registered her complaint), the company boarded up the ceiling of one room with asbestos ceilings, and LOCKED THE RECORD ROOM so the inspectors couldn't get in. This occurred a year ago, and nothing further has been done since.

Recently, two co-workers died of cancer, one from lung cancer. Both people had been heavy smokers. Mary believes that the asbestos may have been a contributing factor because both workers spent many hours in the Record Room. She's frightened for her own health, which is already very poor.

Cigarette Smoke

Cigarette smoke in the office environment is a further hazard to smokers and non-smokers alike. According to one environmental consultant, "The level of particulate matter in office buildings where smoking is allowed is 10 to 100 times higher than the allowable limits for outside air."29/ For clerical workers who spend all day sitting, the effects of smoking on health are magnified, since carbon monoxide from cigarettes stays in the bloodstream longer during low physical activity.30/ A recent epidemiological study concluded that longterm exposure to smoke, limited to the work environment only (i.e. not at home), is deleterious to the non-smoker and significantly reduces small-airway function to the same extent as smoking one to ten cigarettes per day."31 / Cigarette smoke contains numerous potent carcinogens, including benzopyrene, affects not only the lungs but many other organs, and maximizes the effects of other indoor air pollutants because of the density and persistence of particulate matter released. In addition, many legal secretaries and clerks in law offices complain of cigar smoke. Preliminary experiments show that one cigar generates three times the respirable particles of the average cigarette and up to 30 times as much carbon monoxide.32/ There is a great need for improved ventilation and creation of "non-smoking" areas to protect the two-thirds of U.S. adults who do not smoke.

Tight Building Syndrome.

Typical symptoms of tight building syndrome include: fatigue and lethargy (even numbers of employees falling asleep at their desks at about the same time of day); headaches, nausea, dizziness, or lightheadedness; problems with vision; irritated nose and throat; difficulty breathing or sthma-like symptoms; frequent and widespread colds and sore throats; and menstrual irregularities (including intermittent spotting between periods, prolonged or continuous menstruation for weeks or even months, missing menstrual periods).* Previously, such problems were often deemed the result of "hysteria" on the part of workers, but tight

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*There are many potential causes for such problems, and individuals should see a doctor for medical evaluation.

building syndrome is now understood as a "disease entity" related to the work environment.

Researchers describe several types of factors known to bring about this set of health symptoms: 1) irritating and/or toxic indoor air pollutants; 2) biological agents such as fungi, spores, bacteria; 3) inadequate supply of fresh air, stagnant and/or very dry air; 4) high levels of job stress -- excessive work demands, highly regimented work, and/or problems with supervisory style. There is usually a physical 'trigger', a toxic or irritating air pollutant, but at too low a level to account for the widespread health symptoms.[33]

Numerous stories of these problems have been reported by the media. More than 900 employees in the 26 story U.N. building signed a petition that the building was intolerable. For instance, Dr. Dean Baker, medical officer for NIOSH in N.Y. describes an instance where the employees voted to evacuate the building because health problems were so bad, but no "cause" could be found. "We made some suggestions, to set up a worker-management committee, for example," he comments. "We find we have to look at organizational factors as well as toxic agents, although the reports tend to de-emphasize this type of thing. But they (the stress factors) are always there, between the lines...30 out of 50 employees get sick, but no 'problems' are found..."

> For years, employees of the Brookhaven (N.Y.) I.R.S. Service Center have complained of burning eyes, sore throats, sinus problems, vomiting, dizziness, headaches and a metallic taste. Last fall, NIOSH investigators found some evidence that diesel fuel contaminants enter the buildings via rooftop air vents, but "no conclusive toxicity" explaining the symptoms. They point out that the problems are "particularly frequent and distressing" in the Data Conversion, Collection and Computer Room areas, which they describe as follows: "Many of the employees in this building are working under conditions of considerable stress. In the data collection and conversion areas, workers are required to enter tax info onto microfilm machines using VDTs. (They are under pressure to process a large number of forms, their productivity is measured and they are evaluated accordingly..."

Drs. Keenlyside and Hartle conclude that: "These additional stress factors clearly may act to potentiate any health effects from fumes, and should be considered when planning measures to correct the problems."[34]

Summary

Low levels of air contaminants, permissible under government standards, can still have adverse effects on health. People with allergies, respiratory or nervous system problems are often especially affected. Accidents become more likely if employees are drowsy, lightheaded, giddy or dizzy from inhaling fumes. High levels of job stress can increase the effects of low level exposures, while decreasing resistance to illness.

The combined effects of exposure to low levels of several chemicals at once are not well understood, nor are the effects of many years of exposure to very small doses of toxics well documented. For certain substances, scientists point out that no safe levels are known. New chemicals are introduced at such a rapid rate that harmful effects are only discovered many years later.

Furthermore, many allergy specialists are concerned that an increasing number of patients have become oversensitized to all materials made from petrochemicals and other synthetics--even perfumes and some man-made fabrics.

Once damaged, the immune system (which should protect the body) reacts constantly and drastically, causing symptoms which include muscle pain, aches or spasms, extreme weakness, or breathing difficulty. Many of these patients are former office workers who have no known chemical over-exposure outside of their workplace. 35/

New York State and the city of Philadelphia now have "Right-to-Know" laws which require employers and manufacturers to inform employees of the contents, possible health effects, and procedures for safe use of substances used in the workplace. The Philadelphia law also requires that doctors and public officials will be provided with lists of all potentially hazardous substances and associated symptoms. Other countries have laws to ensure improved indoor air quality and to protect employees against low level toxic exposures.

Some steps to improve office air quality include:

- Proper architectural and ventilation engineering design which ensures a good supply of fresh air, adequate air turnover rate, and ventilation of any toxic air pollutants to the outside.
- Offices should be "aired" periodically by opening windows (in off-hours during winter months). Inexpensive air and heat exchanges may prove useful.
- Regular maintenance of ventilation systems and machines is essential; logs should record cleaning and repair schedules should be available to employees to bring attention to health problems.
- Allow employees some control over temperature, humidity and air flow controls, to protect themselves from extremes and drafts.
- Install or "unseal" windows; design buildings which allow the maximum number of employees access to windows which can be opened; don't sacrifice windows in renovating older buildings.
- Special care should be taken to provide exhaust ventilation in workrooms or any areas where printing and copying machines are used; improved filtration methods are needed.
- Substitute safe products for those containing toxic substances; write to manufacturers for "Material (or Product) Safety Data Sheets" on their products and post contents and instructions for safe use.
- If potentially dangerous materials must be handled as part of a job, wear protective gloves and avoid inhalation.
- Jobs should be designed to involve a variety of tasks, so that no one does photocopying or duplicating excessively, for example.
- Airborne asbestos fibers should be immediately eliminated; well-established safety procedures should be followed if asbestos insulation is repaired; if exposed insulation should be sealed at once.

V. DESIGN PROBLEMS IN THE OFFICE ENVIRONMENT

Constant Sitting and Keyboard Work

Most women office workers use machines with keyboards -- type-writers, key entry machines, accounting machines, VDTs-- for a substantial part of the day. They are particularly vulnerable to a variety of muculo-skeletal problems.

> "I'm fine when I first go into work, but by the time I've been there an hour, all the muscles in my neck and shoulders are completely tight," says a data entry worker who processes checks at a specialized machine at the rate of one per 4 seconds all day.
>
> An insurance clerk in Boston comments: "Prolonged use of key entry equipment has caused me neuralgia (acute pain radiating along the course of one or more nerves). Keying with one hand makes your body tense up, especially your arm. I have pain in my wrist, arm and shoulder. Typing does not seem to cause this for me, maybe because you're using both hands then."
>
> A 54-year old file clerk for a Cleveland bank says, "I must lift out heavy parts to fix the check-processing machine when it jams checks. I have tendonitis from lifting the heavy trays, as well as high blood pressure from the stress of the job." She notes that sources of stress on her job are production quotas, inadequate breaks, low pay, an unsupportive boss and supervision problems.

A survey of the scientific literature on the ergonomics of office work-related stress, prepared for NIOSH in 1979, reveals that 25% of the operators of keyboards (such as typewriters, keypunch, accounting machines and video-display terminals) studied were diagnosed as suffering from occupational cervico-brachial syndrome (OCBS), also referred to as occupational cramp/myalgia. 1/ About 50% of the office keyboard operators complained of muscular distress in the arm, neck and shoulders -- symptomatic of OCBS. These problems are substantially worse for users of video-display-terminals (VDT's), and are exacerbated by rapid work-pacing which is characteristic of clerical work. 2/

Some scientists believe that static load production resulting from the dynamic muscular activity of the fingers while the muscles of the upper body operate statically in order to keep the hand properly positioned is inherent in conventional keyboard design. But excessive muscle strain can be dramatically reduced if ergonomic recommendations are followed in workplace design. Japanese scientists who observed office workers engaged in mechanical tasks recommended periodic examination, and emphasized job rotation and rest periods for such workers. 3/ The NIOSH literature review concludes that the importance of rest periods "cannot be over-emphasized."

Office workers are also particularly susceptible to musculo-skeletal problems, such as tendonitis, carpal tunnel syndrome and tenosynovitis, a painful inflammation of the tendons of the wrist due to overexertion from constant repetition of stereotyped movements.4/ In addition to these problems, a Swedish study conducted in 1976 found that frequent upper back pain tends to accompany office computerization. 5/

A woman, now in her fifties, did item-processing for a Cleveland bank for ten years. The work involved using a special processing machine with one hand all day to process checks. "First my wrist and arm and shoulder would ache, and it got worse gradually. Then I began to get sharp pain -- in different spots along my arm, sometimes my wrist, other times my shoulder, it was hard to tell sometimes where the pain came from. Finally, I completely lost the use of that arm and had to stop working. Well, I recovered after a while of being disabled, and now I do other work. I can't do that type of job again."

Office Chairs

"Executives get the best chairs, and secretaries get the worst, which is too bad, because secretaries spend more time in them," remarks a University of Wisconsin professor who designed "model" chairs. 6/ Sitting all day can add to blood circulation problems, varicose veins, and hemorrhoids. Poorly designed office chairs and constant sitting contribute to muscle and spinal column tension, leading to lower back pain commonly cited by office workers, and can even lead to spinal damage. 7/ Again, rests from constant sitting and job rotation can reduce such health problems, although long-term solutions require job redesign and proper office furniture design standards such as other countries have. The least a manager can do for the clerical and secretarial staff in an office is to buy each a good $75 or $90 chair, as many occupational health researchers recommend. From a cost-benefit point of view, a good chair pays for itself almost immediately in the time it saves employees from "squiggling" and awkward motions and gestures in a non-adjustable chair. Dr. E.R. Tichauer of N.Y.U. estimates a gain of 40 minutes of productive working time per day when employees are provided with properly designed seating,8/ which adds up to 21 working days a year. In one instance, an industrial engineer recommended an additional two hours per day for VDT users in the workplace studied to complete their work unless the uncomfortable, inflexible low quality chairs were replaced with well-designed ones.

Lighting and Eye Strain

Many office workers work in areas where lighting is described as "twilight," while others suffer from glare, as offices often register a glare index of 24 rather than the recommended value of 19. 9/ Poor lighting often combines with other design problems.

"I'm not positive, but two things have especially bothered me and affected my health," says a 28 year old cashier for a Boston university. "My sitting on a high chair pitted up to a counter where I am a cashier is really uncomfortable and may have contributed to the lower back strain that kept me out of work for a while last Spring. Also, the fluorescent lights are too bright, and I think they may be what gives me splitting headaches."

Adjustable lights, spot-lighting, and the use of non-reflecting materials (such as matte rather than shiny finish in wall paints) and colors can reduce these problems.

In addition, scientists are raising concerns about the long-term effects of fluorescent lighting. 10/ Full-spectrum light is important to good health. Full-spectrum fluorescent lights are available, but are rarely found in clerical work areas.

"Referred Pain"

"Referred pain" can also result when the muscles of the eyes are severely strained. Eye muscles are especially likely to become worn out from switching focus back and forth from hard copy (black on white print) to light on dark images on most display screens. Dr. Stellman explains the phenomenon, which is easily recognizable for many employees who do visually demanding work:

> "Your eyes do not have the capacity to become stronger, and therefore, they'll become fatigued. When your eyes become fatigued, you're not goint to necessarily feel eye pain although you may. What will happen is that the nerves in your eyes will rapidly become overwhelmed, and your body will refer that pain to someplace else -- you'll get a neck ache, you'll get a back ache, you'll get a stomach ache. You'll get an ache in those areas of the body that are more capable of expressing pains... And when you overwhelm your total system, you'll become totally fatigued..."

Noise.

Experiments have shown that workers exposed to moderate or intense noise on the job have increased incidence of circulatory, digestive, neurological and psychiatric problems. Noise is also a major contributor to occupational stress for women office workers, and can cause fatigue. Prolonged exposure to noise levels above 90dB (A), the OSHA limit, leads to hearing loss. Many scientists believe exposure at or below 85 dB can cause hearing problems. 11 /

Office noise levels are considered acceptable in the range of 55 to 70 dB .12/ Typical measured levels of noise in offices with five machines operating register 64 to 73 dB(A), beyond recommended standards. Under such conditions, phone conversation is difficult and a normal voice can only be heard within a 2-foot range.

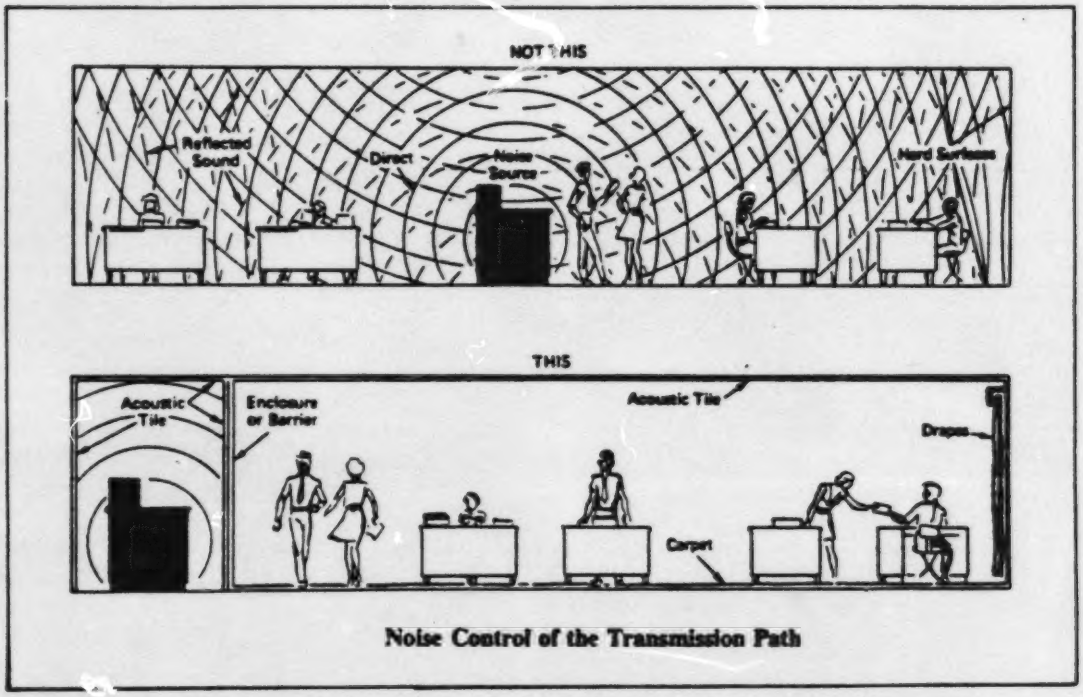
Typewriter noise is generally 63 to 69 decibels, while an office tabulating machine has a decibel level of 80 or above. An employee who works continuously on machines such as these in a small, confined room (as if often the case) encounters a potentially hazardous noise level. Years of noise exposure on the job have caused some keypunchers to suffer permanent partial hearing loss.13/

> An executive secretary who has worked at the same corporate headquarters office for seven and a half years writes: "After sitting near two telecopiers, a MagCard and an electronic typewriter every day, I developed ringing in my ears and subsequently went to two ear specialists who said I have noise-induced hearing loss at the 6,000 frequency level."

The illusion that large-space open office solve the problem of noise is disproven by an ergonomic investigation of fifteen such offices in Switzerland.14/ Noise levels still ranged from 56 to 64 decibels with machines operating. The upper limits casue stress and are considered loud enough to make phone and voice communication difficult and interfere with concentration.

> A secretary for a Houston retail company describes the conditions she has worked under for the past 11 years: "Calculators, typewriters, piped-in music -- loud -- MagCard memory typewriter, air conditioning (large) fan -- all of the above are in an open office with four secretaries answering telephones, placing calls, taking orders, etc. all in an open type area." She indicates that the noise levels cause stress, interfere with concentration and communication and make it harder to hear conversation, radio or tv at the end of the workday.

Office noise can be absorbed by carpeting and plants, and reduced by mats under typewriters and plastic covers over typewriters and other equipment. But a better solution would be the production of "quiet" office machines. A typewriter manufacturer testified at a noise hearing that sound-attenuating materials could be built into electric typewriters at an additional manufacturing cost of only 60¢ per machine.15/



Noise Control of the Transmission Path

Reprinted with permission from the U.A.W. Social Security Department.
From: Noise Control: A Worker's Manual, edited by Dan MacLeod (Feb. 1978).

Environmental Design.

Many office workers are confined to overcrowded workspaces, while others work in near isolation. In Working Women's survey, the majority of respondents complained that there was no rest area or lunchroom to go to for peace and quiet or to get to know co-workers. One-third cite overcrowding as a problem, a condition which is highly correlated with respondents' rating of their jobs as "pleasant," "somewhat stressful," or "very stressful."

> A full-time secretarial "temp" for the last several years, M. estimates that she has worked in about 30 different offices in downtown Cleveland: "I cannot believe some of the situations in which full-time employees continue to work," she says. "Claustrophic work areas are among the problems I've seen. This includes 'wooden pens' which provide the secretary total privacy but no view of anything but her typewriter. Many secretarial rooms are literally 'closets' and even one sloset opening off another closet (hard to describe; this must be seen), and usually overcrowded. Psychologically, this confinement has to be harmful..."

Office Safety Hazards

Accidents and Injuries. The U.S Department of Labor estimates an annual rate of 40,000 disabling accidents among the nation's office workers, and approximately 200 office-related deaths per year.16/ The most frequent causes are falls or slips, accounting for 50% of all office accidents;20% of falls in one study were attributed to "chair design." 17/ Other frequent causes are lifting stress, and accidents which involve unstable file cabinets and shelving (generally striking against or being struck by objects). Accidents are most likely to occur during or just after an office move, and during office "rush hour" when a deadline must be met.

> A legal secretary in Boston told Working Women: "Shortly after I began working here, one of the other secretaries who had been here a long time and seemed to have a good work relation with her supervisor hurt her back when she pulled a file drawer and the cabinet almost tipped. I saw it happen, I saw the painas her back went out. She filed for Workers' Compensation, and after that the lawyers were just terrible to her, they made it miserable for her to keep working here. And the firm fought the comp case very hard. Just like that, she went from being a well-liked employee to an enemy overnight, on top of suffering her injured back..."

In a California study in 1959, women office workers constituted 66% of the observed population, but accounted for 80% of the injuries. A New York insurance company, where a study was conducted for five years (1962-66) found that disabling injuries were twice as frequent among new employees; women office workers accounted for 50% of all newly hired insurance employees in 1977. Most of these accidents could have been prevented if workers were trained properly with available educational materials.

Fire Hazards. Concern over fire dangers in giant office complexes has been heightened by the tragic hotel fires of 1980. A number of factors increase the risks in modern offices. "The completely undivided ceiling" and floor-to-ceiling windows typical of large open-space offices make it possible for "an instantaneous flash of fire" to spread. Modern high-rises are "criss-crossed with wiring that may become overloaded." The widespread use of synthetic materials in buildings poses perhaps the most frightening new problems. When plastics burn, most generate fumes with poison gases. Dr. Jeanne Stellman writes that many fire deaths attributed to smoke inhalation are more accurately described "as due to chemical-fume poisoning." Lax enforcement of building and safety codes, codes inadequate to deal with modern fire dangers, and codes compromised for the sake of "economic development" at the cost of employees' safety only add further risks.18/

> "Safety Officials Fear Skyscraper Holocaust Could Kill Thousands. They Cite Buildings' Design and Location, Lax Codes, Poison Gas From Plastics," ran the headline of a Wall St. Journal series in the winter of 1981. 19/
>
> Two members of Pittsburgh Women Working's staff were in their office on the 12th floor of a 20 story office building at the end of the workday. Earlier in the week, the fire alarm had gone off and all the employees had evacuated the building but it was a false alarm. On Wednesday morning, the building management circulated a memo describing the new fire alarm system and reassuring employees. At about 5 p.m. that same day, Betty Arenth recalls, "A man from the office across the hall opened our door and said, 'There's smoke in the building.' Before he finished the sentence, the smoke started coming in to our office. He grabbed his things and joined us. We stuffed our jackets, anything we

could find, into the door and mail slots. The fire department was notified and we waited about 15 or 20 minutes until we couldn't stand the smoke and opened the windows. We were screaming to the people 12 stories below that we were trapped, we were so frightened. The firemen reached us and carried us down the long ladders. About 40 people had gone up the stairwell to the roof, the fire procedure for our building. When they got to the roof, the door was locked and no one had the key. Luckily a repairman in the building had grabbed his toolbox, and he broke the lock, so they were rescued from the roof.

The smoke alarms never went off. The people on the 6th floor, where the fire was, tried to pull an alarm and it came right out of the wall. Fortunately, the fire was confined to the 6th floor and didn't spread even though the smoke did. The media asked a spokesman of the company which installed the system about the alarm pulling out of the wall and he said, 'I guess a person could pull it out of the wall if they were in a state of stress.' What kind of state are you supposed to be in when your building's on fire? The whole incident was terrifying, we had nightmares for days."

At a Boston travel reservations center, the employees are afraid their office is a firetrap. There are about 60 employees on two shifts working on the 6th floor of an older building with two elevators, one main entrance, and only one fire escape which is accessible through a window in the last stall of the ladies bathroom. Four employees described their work area: "There are only two fire extinguishers for the company. The main entrance is often cluttered with boxes of computer equipment and paper supplies....There are plasterboard covered walls and wires running along the floors..The office is set up open-plan style... The local firestation claims that the recently passed Proposition 2½ prevents them from sending firemen over to demonstrate the proper evacuating method, because of personnel cuts." The women want the management to provide training for emergency exiting, keep the main entrance clear, and post signs to indicate fire exits. They also want the company to rent more office space to reduce the overcrowding, excessive noise and the fire risks.

Better codes and better enforcement are urgently needed. Employers must take responsibility to ensure that all employees are trained in emergency procedures and that fire safety devices are in working order.

VI. RESULTS FROM WORKING WOMEN's OFFICE WORKER HEALTH AND SAFETY SURVEY

The Office Worker Health & Safety Survey was distributed in the fall of 1980 in Cleveland and Boston, by Working Women affiliates Cleveland Women Working and 9to5 respectively. Approximately 1,300 responses were received from the total 16,000 surveys distributed. Results are presented here for 960 survey respondents.* A copy of the survey form is included. (Appendix 1.)

Job Stress

Of 915 survey participants who answered the questions on stress, 76.1% described their working conditions as "very stressful" (27.1%) or "somewhat stressful" (49%), while 23.9% rate their overall office environment as "pleasant".

Thirteen major sources of stress, drawn from a review of the research literature, were listed. "Lack of promotions or raises" (51.7%) and "low pay" (49%) are by far the greatest sources of job stress for women office workers. "Monotonous or repetitive work" and "no input into decision-making" also emerge as outstanding stressors. Two in five respondents cite monotony and 35.1% cite lack of input into decision-making as major problems. Heavy workload, unsupportive bosses, supervision problems, an unclear job description are major sources of stress for more than one in four respondents. (See Table 1., page 9, for all sources of stress by rank order.)

The results of Working Women's survey compare well with previous studies identifying sources of stress which seem to be "universal" among diverse jobs. But some problems rank much higher in importance than for men studied previously. Women office workers rank low pay as the second greatest source of stress, while in studies of male workers "pay" generally ranks 8th or 9th in priority. Dead-end jobs are the number one source of stress cited by clerical women.(Although many studies find that not being able to use one's skills to the fullest causes strain, the magnitude of the problem is striking.) "No input into decision-making," "heavy workload" and "monotonous, repetitive work" appear within the top six sources of stress in many studies and in the Working Women survey.

> A data entry worker who's been on her job twelve years describes how she and her co-workers are ignored concerning office policy: "The supervisor won't listen to any suggestions. She takes any criticism personally. Nothing gets accomplished. She has a very bad attitude, "Like it or get out." All the supervisors push and push production and compare you to others and yourself on past days. If they want you to work somewhere in another department, they just move you around, seniority means nothing to them."

Difficulty juggling work schedule with home/family responsibilities. One rather surprising finding of the survey is that, overall, office workers do not consider juggling work schedules with their responsibilities at home to be a major stressful burden, despite popular notions to the contrary. Though the combination of these two responsibilities can often equal two full-time jobs, or more, women indicated that they could handle the "juggling", and that it was the quality of their work life that created the most stress in their lives.

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* Results of the full 1,300 responses will be presented at a later date.

However, the 117 women who do find it hard to juggle work and home schedules. described more problems with their health. Supervision problems and lack of input into decision-making are even greater problems for this group than for the average respondent. They experience more eyestrain (60.7%), headaches (61.5%), severe fatigue (47%), digestive problems (32%) and insomnia (27.4%) than average. (Rates for health problems are shown on page 51.). Almost one in four feel their health is worse as a result of the job compared to one in three of all respondents, and they lose time from work due to health problems at a 30% higher rate than average.

Not surprisingly they are more likely to have children--more than two in five have one or more child. But they still account for only 20% of all respondents with children. They are likely to be married but represent only 17% of all married respondents, more likely to be separated or divorced but represent only 16% of separated or divorced women answering the survey. They are slightly less likely to be the sole supporter of a household, and account for only 11.4% of all sole supporters.

Sexual harassment was reported as a major source of stress by 51 women. Although the least frequently cited source of stress, sexual harassment has particularly severe effects. Among women who experience insomnia, severe exhaustion and "nervous stomach" problems all at once, one in six was the victim of sexual harassment compared to only 5.6% of all survey respondents.

Air Quality and Ventilation

Nearly 90% of the office workers surveyed complain that their office is either too hot or too cold or both. Two in five--fully 40%--report that there is no fresh air at all where they work, only stale, stagnant air or "re-conditioned air". Another 30.8% describe the supply of fresh air as inadequate. Two-thirds say that there is "no circulation at all" or that the system is "poor". More than one in six complain of drafts which add to muscle strain, especially stiffness in the neck, shoulders and upper back.

Irritating fumes pose problems for 25% of all respondents. Sources break down as follows:

		% of fumes	% of total survey
Total reporting irritating fumes	244	100%	25.4%
Smoke from cigarettes or cigars (1)	100	41%	10.4%
Photocopying machines	34	14%	3.5%
Duplicating or printing machines	18	7.4%	1.9%
Other sources (no detail given)	36	15%	3.7%
Other sources (with description)(2)	56	23%	5.8%

Notes: 1) Since all of the comments on smoke are write-in's, the response would surely be even higher if the category were given.
2) "Laboratory fumes" (reported most often by university employees) and "car exhaust" from nearby garages and/or parking lots are the most common of these responses, followed by complaints about chemical-treated paper and carbon paper.

Descriptions of air quality and ventilation problems include: One respondent who writes: "When the ceilings were lowered and the plastic dividers made with formaldehyde were installed, my nose and throat were so irritated I could barely work." A federal employee says: "We taped crepe paper to the air circulation vents as an experiment and sure enough, the paper hardly moved for days." Several women write that extremely dry air causes very dry skin and sore chapped hands. Severe problems can develop.

> A senior secretary for a Boston bank says: "My sensitivity to smoke causes me severe cough, nausea, and dizziness which resulted in insomnia. At times the problem has been so bad that I had to be absent. I subsequently contacted a lawyer and with him I have been working with the personnel department to try and solve the problem, to get a non-smoking area set up. Something must be done!"
>
> An employee for a Cleveland bank who uses an electronic scanner describes her "totally unventilated" and "extremely smokey" work area. "The air current from machines carries smoke to all the non-smokers constantly. Recently, an industrial cleaning fluid was used and I had to leave the premises after inhaling damaging fumes. I lost 3 hours pay, but I couldn't stand it."
>
> And from an insurance claims examiner: "I get conjunctivitis from the eye strain and the carbon paper. Earlier this year, I had to stay out of work for two days because I could not open my eyes without burning and tearing."

Many office workers add that the poor air quality has a negative effect on their productivity, making it hard for them to concentrate or making everyone in the office too upset and irritable to work at top efficiency.

Office Environment

Survey questions regarding the office environment asked about noise, lighting, chairs and the design of office space. One in three respondents say their offices are too noisy. Of 41.8% who report problems with office lighting, 271 complain of glare while 131 say the lighting is too dim for the work they perform.

Office chairs for clerical and secretarial workers are in great need of improvement, as the survey results indicate. One in six get backstrain from sitting all day in poorly-designed chairs, and fully one third say their chairs are uncomfortable. Office workers who sit virtually all day doing close visual work deserve to have chairs and lighting adjustable to their needs to maintain both their effectiveness and health. 36.4% of the respondents say that their offices are too crowded, and the majority note that there is no rest area or lunchroom. "Just to have a quiet place to go for ten minutes to be alone during the day would do so much to relieve tension," remarks one woman. Lack of privacy and personal space reflect an office design that is insensitive to the needs of non-managerial staff. Improvements in office lay-out and the provision of adequate space for privacy and relaxation are problems well within the means of most employers to solve.

Office Machines

More than one in three respondents — 37.2% — use a video display terminal (VDT) or word processor in their job. Another 3.6% (36) use microfiche, microfilm or micro-readers. Key punch or other key entry equipment is used by 12.2% of the office workers surveyed, and 13% say they use computers on a regular basis. Three-fourths use photocopying machines; among secretaries, 86% to 96% to copiers.

Of 133 office workers who describe health problems from working with any of the above machines, the majority cite eyestrain, especially "burning" or "itching" sensations. Other prevalent problems are headaches, backaches and "tension". Almost half of all those reporting problems with machines use VDTs. "Back strain and eye strain from working at a CRT lead to migraines," notes one woman. A telephone representative for an insurance company writes: "The desk and VDT don't match, and I get backstrain every day. I am pregnant, but I get menstrual spotting — I think it's from the stress."

Fumes from photocopiers, cleaning fluids, and paper are also mentioned. "I get sinus problems from the toner and cleaner I have to use with the Xerox machine," says one respondent. A government clerk reports "occasional rashes from toning powder and fluid used for the copier." And a bank clerk explains "Fibers in the paper from the machine I use cause skin and eye irritation."

A small but significant number of employees (12) express fear that they are losing their hearing from working too close to certain data-processing and word-processing-printing machines.

Job-Related Health

About one in three survey participants feel that their health has deteriorated as a result of their present job, while 58.2% feel their health overall is the same. Interestingly, 7.4% feel their health is better in their present job—some add comments that they have recently changed from a very stressful position. But other studies show that women's health often improves when they work in the laborforce rather than solely working at home.

When office workers are compared according to how they rate levels of stress in their overall office environment, we see startling differences: 46.6% of those who say their jobs are <u>very stressful</u> feel their health has declined, while only 11.9% of those giving their office job a <u>pleasant</u> rating consider their health worse, and 12.3% consider it better.

The following table shows the incidence of health problems for all respondents, and compares those reporting "very stressful" and "pleasant" working conditions. For every symptom except one—skin rashes—the differences between the "very stressful" and "pleasant" groups are highly significant.

Data were compared for VDT users and non-users; for office workers using data-processing equipment and those not using keypunch, key entry or computer equipment; respondents reporting air quality and ventilation problems vs. those reporting good air quality and ventilation and no irritating fumes; cross-tabulations by industry, job title, age, income level and other characteristics were analyzed. Only some of the results are presented at this time.

OFFICE WORKERS HEALTH & SAFETY SURVEY: JOB-RELATED HEALTH PROBLEMS

Health Problem	Incidence		
		Respondents rating jobs as:	
	Average (n=960)	Pleasant (n=219)	Very Stressful (n=248)
Eyestrain	54%	39.3%	68.2%
Headaches	51.2%	30.6%	67.7%
Muscle strain, pain in back or neck or both	46.5%	30.6%	57.7%
Exhaustion or severe fatigue at day's end	39.6%	20.55%	64.9%
Digestive/stomach problems or heartburn or both	24.0%	12.3%	37.5%
Pain in arms, shoulders or both	20.7%	10.05%	26.6%
Problems from constant sitting	19.6%	12.3%	25%
Insomnia, trouble sleeping	18.3%	7.8%	31.45%
Aching wrists or tendons of the hands	10.7%	5.5%	15.3%
Nausea or dizziness	10.6%	3.65%	14.5%
Skin rashes or irritation	8.1%	5.94%	11.7%

More than one in five---22.6% of the office workers had lost time from work due to job-related health problems, often to see a doctor concerning symptoms or medical conditions, sometimes when stress on the job became overwhelming: "I missed two days work due to severe tension which caused stomach pains, dizziness and shakiness" explains a bank clerk. A government clerk typist writes: "The tension, causing chest pains and headaches has been so severe that I have missed work; the workload is so unequalized -- some have too much, some have too little." "I was hospitalized for half a day when I temporarily lost my vision. The doctors said it was from tension headaches, and I am still an outpatient," a confidential secretary reports. A young insurance supervisor, 23 years old, reports: "I had to spend time at home to rest and calm down after developing bleeding ulcers," and another ulcer victim is a 36 year old bank employee who writes: "I developed a large duodenal ulcer and had to stay out of work quite a bit. This was mainly due to a 'manager' who was just terrible to work with. Thank goodness he recently left -- I feel much better." And a older, experienced sr. secretary in Boston says "Since coming into this department at John Hancock Insurance, I have deceloped high blood pressure and a heart problem."

Many, many women commented that they need to take time out for their health's sake but cannot afford to. This is reflected in the finding that women at lower family income levels were much less likely to have lost from from work than respondents reporting higher family incomes ($14,000 or more), although office workers at the lowest and highest ends of the family income scale reported the highest frequency of medical conditions. A young bank employee in Boston who had a very complicated first pregnancy writes: "I returned from 8-week maternity leave of absence even though I was still very sick. I was allowed this much time before my job was in jeopardy." A VDT operator for an insurance company explains: "I suffer while working, but we are not allowed many sick days and I can't affordto lose the pay. I have to save my sick days until I am completely helpless."

More than two hundred of the survey respondents (22.7%, N=213) have one of the following medical conditions: an ulcer or diagnosed pre-ulcerous condition, hypertension or high blood pressure, or coronary heart disease (6 cases reported). One in three of these respondents describe their jobs as very stressful, and they feel even more strongly that lack of promotions is the major cause of stress on the job than the survey average. A policy examiner for a Boston insurance services office notes: "When the Red Cross checked blood pressure of donors here last June, they said almost all of us have elevated levels and that is was unusual."

TABLE: OFFICE WORKER HEALTH & SAFETY SURVEY
SOURCES OF STRESS FOR SELECTED INDUSTRIES
(Adjusted Frequencies)

Banks & Finance N = 184		Insurance N = 163	
Low pay	59.2%	Low pay	57.1%
Lack of promotions	54.4%	Lack of promotions	56.4%
Supervision problems	33.2%	Monotony	42.3%
Unclear job description	33.2%	No input into decision-making	41.1%
Monotony	32.6%	Unable to express anger	35%
Heavy workload/overtime	31.5%	Production quotas	33.1%
No input into decision-making	31.5%	Inadequate breaks	28.6%
Unsupportive boss	30.4%	Heavy workload/overtime	27.6%
Production quotas	15.8%	Unclear job descriptions	27.6%
Unable to express anger	21.7%	Unsupportive boss	25.7%

Public Sector N = 179		Law Firms N = 84	
Lack of promotions	52.5%	Heavy workload/overtime	39.3%
Monotony	43.6%	Lack of promotions	39.3%
Low pay	43.0%	Low pay	36.9%
Supervision problems	40.8%	Monotony	35.7%
No input into decision-making	38%	No input into decision-making	32.1%
Unsupportive boss	36.3%	Unable to express anger	32.1%
Heavy workload/overtime	33.5%	Supervision problems	26.2%
Unclear job descriptions	29.6%	Unsupportive boss	20.2%
Production quotas	25.1%	Inadequate breaks	20.2%
Unable to express anger	16.2%	Unclear job descriptions	16.7%

Rates of response for all 915 office workers answering the questions on stress are shown in Table 1, page 9.

Job and Personal Characteristics

The mean age for survey participants is 29 years old, and the median is 26.4. One in three (34%) are over 30 years old. Minority women account for 20% of respondents (N=185), and 23 men answered the survey (2.4%). As for marital status: 36.5% are married, 17.1% are separated, widowed or divorced (13.5% divorced) nd 41.6% are single. More than one in four have children; one in eight is the mother of two or more children. A similar proportion (25.2%) report dependents but they are not identical groups -- many respondents note that they support an aging parent or other relative, or that they help support other relatives' children. Of the 759 respondents who give information on total family income, 32.9% are sole supporters of their household or themself (77% of this group have children). For all respondents who give information on family income, 36.1% are at $12,000 level or below (20% of all have family income of $10,000 or below), 46.9% report total family income of $14,000 or less, 56.4% at $16,000 or less, 67.5% at $20,000 or less, 32.5% between $20,000 and $30,000 and 12% have family incomes above $30,000. These income levels vary by industry sector: in banking, half of all respondents report family incomes of $12,000 or less; in university/college employment, 47% are at family incomes levels of $12,00 or less; for these two industry sectors plus publishing employment, three-fourths of the office workers have family incomes of $20,000 or less.

By industry, participants are employed as follows: banking and other financial (20.4%); insurance (18%); public sector (19.4%); law firms (8.9%); universities (N=65); corporate/mfg (N=63); publishing (N=46); other, which includes retail, utilities, transporation and business services (N=96). The largest job categories are secretaries (about 30%), clerks and typists(22.5%),specialized jobs in banking and insurance (N=68), supervisors (N=44) and data-processing workers (N=26); 18 job titles were analyzed.

VII. CONCLUSION: A CALL FOR ACTION

Toxic chemicals, noise, inadequate lighting, poor equipment design, and accidents pose serious health hazards for millions of office workers. Stressful pace, job design, low pay, and other working conditions cause a further strain on office workers. As a result, office workers are particularly prone to job-stress-related diseases.

As the office workforce grows, these dangers must be addressed. Office health hazards can and must be reduced. Manufacturers, employers, employees, and government must take immediate action toward office worker safety and health.

The drive for high corporate profits is no justification for the destruction of office workers' health and well-being. Yet even those who could sacrifice employee health for higher profits must recognize that the small savings achieved by skimping on noise control devices or fresh air supply may well represent a false economy. Productivity suffers and absenteeism rises when working conditions take a toll on employees' health. Efficiency and accuracy decline along with job satisfaction when demands for speed and production are too high. Workers' Compensation for on-the-job-stress is granted only after the damage is already done. Preventive measures are needed to protect office workers' lives on the job.

Many office health hazards can be simply and inexpensively reduced:

Stress reduction can be achieved by changing the supervision style, re designing jobs to allow for more variety and recognition, creating advencement and training opportunities, and providing adequate rest breaks. Accommodation to the needs of the working family--e.g., flex-time and child care--can also reduce stress for many employees.

Some relief from the risks associated with video-display terminals can result from frequent rest breaks, improved adjustable machinery, and maximum flexibility and comfort in workstation design. Jobs involving VDT work should allow greater control over the pace and organization of work. Job redesign may be required to reduce stress and improve job satisfaction.

Problems associated with sitting at a keyboard for long periods can be minimized by better chair and equipment design, rest breaks, and rotation of tasks.

Noise can be reduced by the introduction of sound-absorbent materials into the office, by modifications of office machines and by the manufacture of quieter machines. Adjustable lighting and materials that reduce glare can relieve visual strain.

Inexpensive modifications in ventilation systems can keep fuel costs down while also improving air quality. Regular cleaning and maintenance is a must.

Exposure to some toxic chemicals may exceed government limits. Lower-level exposures, within legal guidelines, can still have adverse health effects. Adequate exhaust ventilation and the substitution of safer products can help to eliminate these hazards. For chemicals where standards do not yet exist or safe levels are not yet known, a cautious approach that protects employees from exposure--before it is too late--is essential.

Accidents and injuries can be prevented through proper equipment, better training, and planning to avoid unnecessary rush periods. The dangers of fires in the office buildings have increased. Fire precautions need urgent attention and improvement.

Manufacturers

Manufacturers must act responsibly to minimize the health hazards in office products and machines. In many cases, pressure from European unions and buyers has led to the development of safer technology by American manufacturers. Why should not American office workers benefit from these technological improvements as well?

Employers

Employers must become aware of the large body of research documenting office health hazards and implement preventive measures to reduce and eliminate them.

Government

Congress and the regulatory agencies--federal, state, and local--must ensure effective enforcement of existing health standards in the office. Testing and labelling of hazardous substances must be required by law and enforced. Health standards must be developed for the manufacture and use of video-display terminals. And research agendas, new technologies, and standards must be developed to address long-term exposure to low levels of toxic chemicals, high levels of stress, office noise, and the problems of repetitive motion.

Employees

Finally, employees themselves must take the initiative to become aware of office health hazards, to share their concerns, and to organize for solutions both in the workplace and in the development of public policy.

The full toll of office health hazards is not yet known. But we do know that an epidemic of job-related diseases is certain unless we take steps to reverse it. We must begin to take those steps today.

APPENDIX 1.

OFFICE WORKER HEALTH & SAFETY SURVEY

Cleveland Women Working is an organization of women office workers concerned about problems on the job. We are compiling information on the occupational health of women office workers in Cleveland. Working Women, the National Association of Office Workers, has received funding from the U.S. Occupational Safety and Health Administration (OSHA) to conduct a year-long educational campaign in Cleveland to inform and counsel office employees, employers and the general public about office health risks and their solutions. All information is strictly confidential. General results will be announced at a later date. Your help and participation is appreciated.

I. STRESS

1. How would you rate your overall office environment?
   ____ very stressful ____ somewhat stressful ____ pleasant
2. What are the greatest sources of stress on your job? (check 5)

____ overtime/heavy workload	____ low pay	____ unsupportive boss
____ production quotas	____ lack of promotion/raise	____ supervision problems
____ inadequate breaks	____ unclear job description	____ no input into decision-making
____ monotonous/repetitive work	____ sexual harassment	____ difficulty juggling work schedule with home/family responsibilities
unable or reluctant to express frustration or anger		

II. AIR QUALITY AND VENTILATION

1. Is your office ____too hot ____too cold ____drafty ____dusty ____ other
2. Is the supply of fresh air ____good ____inadequate ____no fresh air at all
3. Is the air circulation ____good ____poor ____no circulation at all
4. Are there irritating fumes in the air? ____ yes ____no
   If yes, where do they come from? ____ xerox or photocopying machines
   ____ duplicating/other printing machines ____ other sources (explain)_____

III. OFFICE ENVIRONMENT

1. Is your office ____too noisy ____ too crowded
2. How would you rate the lighting? ____good ____too dim ____ too much glare
3. How would you rate your chair? ____comfortable ____uncomfortable ____ causes backstrain
   ____ causes other problems (explain) _____
4. Is there an adequate rest area and lunchroom for your office? ____ yes ____no
5. Is your office moving to a different building in the near future? ____ yes ____ no
   Will is be a newly constructed building? ____ yes ____no
6. Is your current building/office being remodeled, redesigned, renovated? ____ yes ____no

IV. OFFICE MACHINES

1. Do you work with any of the following office machines?

____ video-display terminal (VDT/CRT)	____ keypunch ____other key entry
____ word processor	____ computer
____ photocopying or xerox machines	____ other specialized machine (specify)
duplicating machines (mimeo, ditto, etc.)	

2. Do you or your co-workers experience any health problems from working with the machine(s)? Please describe _____
3. Do you know if your employer has plans to bring in new machines (such as computer systems equipment, etc.)? ____ yes ____ no ____ not sure ____ Explain _____

V. JOB RELATED HEALTH

1. Would you rate your overall health as ____better ____ worse ____ the same as it was before you were employed at your present job?

Cleveland Women Working
1224 Huron Rd.
Cleveland, Ohio 44115

Postage will be paid by:

BUSINESS REPLY MAIL No postage necessary if mailed in the United States

FIRST CLASS
Permit No. 393
Cleveland, Ohio

Continued from front side

2. Do you experience any of these health problems as a result of your job? (check all that apply)
   ___eyestrain ___headaches ___nausea/dizziness ___insomnia/trouble sleeping
   ___muscle strain (pain in ___back ___neck ___arms ___shoulders)
   ___exhaustion or severe fatigue at day's end
   ___digestive or stomach problems ___ heartburn
   ___skin irritation/rashes from printing ink, carbon, liquid paper, solvents, etc.
   ___problems from constant sitting ___ aching wrists or tendons of the hands
   ___other (describe) _____

3. Have any of the above caused you to lose time from work? ___ yes ___ no If yes, please explain _____

4. Please note whether you have any of the following health conditions: ___ulcer ___hypertension ___high blood pressure ___pre-ulcerous condition ___coronary heart disease

VI. JOB INFORMATION

1. Job title _____ Company _____
   Industry _____ Location of company _____
2. Do any of the following issues need improvement in your office? ___pay ___raises ___benefits ___respect ___job advancement ___job training ___job descriptions ___vacation ___supervision ___other

VII. PERSONAL INFORMATION

The following questions should never appear on any job application. We are asking them because it will help us determine exactly who we are representing, your problems and needs, so that we can act effectively.

1. Age ___ 2. Racial minority? ___yes ___no 3. ___Female ___Male
4. Marital status: ___married ___separated ___single ___divorced
5. Dependents: Number of children living with you ___ Number of people (children, spouse, other) who are dependent on you for financial support ___ Are you the sole support of your household? ___ yes ___ no
6. What is your total family income (yours and your spouse/companion's)
   $_____ per year/$_____ per week

OPTIONAL (This section will be detached.)

Name _____
Address _____
City _____ Zip _____
Phone/home _____ Work _____

___ I'd like the results of this survey.
___ I'd like more information about the Office Workers Health and Safety Project.
___ I'd like to know more about Cleveland Women Working.

FOOTNOTES

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